PACIFIC SALMON COMMISSION
SELECTIVE FISHERY EVALUATION COMMITTEE

REVIEW OF MASS MARKING AND MARK-SELECTIVE FISHERY ACTIVITIES PROPOSED TO OCCUR IN 2014

REPORT SFEC (15)-2

July 2015

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[1] Past committee members who provided input to this report include: Mr. Kirt Hughes, WDFW; and Ms. Laurie Peterson, WDFW.

LIST OF ACRONYMS WITH DEFINITIONS

ADFG	Alaska Department of Fish and Game	**NWIFC**	Northwest Indian Fisheries Commission
AK	Alaska	**ODFW**	Oregon Department of Fish and Wildlife
BC	British Columbia	**OR**	Oregon
BY	Brood Year	**PS**	Puget Sound
CA	California	**PSC**	Pacific Salmon Commission
CDFO	Canadian Department of Fisheries and Oceans	**PSMFC**	Pacific States Marine Fisheries Commission
CDFW	California Department of Fish and Wildlife	**PST**	Pacific Salmon Treaty
COLR	Columbia River	**QIN**	Quinault Indian Nation
CoTC	Coho Technical Committee	**RMIS**	Regional Mark Information System
CST	Coast	**SFAWG**	SFEC- Analytical Work Group
CTC	Chinook Technical Committee	**SFEC**	Selective Fishery Evaluation Committee
CWT	Coded-Wire Tag	**SFRCWG**	Regional Coordination Work Group
DIT	Double-Index Tag	**SHRP**	Sport Head Recovery Program
ER	Exploitation Rate	**JDF**	Strait of Juan de Fuca
ETD	Electronic Tag Detection	**TERM**	Terminal Fishery
ID	Idaho	**URB**	Upriver Bright (Fall Chinook)
IDFG	Idaho Department of Fish and Game	**US**	United States
MM	Mass Marking	**VTR**	Voluntary Trip Report
MOU	Memorandum of Understanding	**WA**	Washington
MSF	Mark-Selective Fishery	**WCVI**	West Coast Vancouver Island
MU	Management Unit	**WDFW**	Washington Department of Fish and Wildlife
NSF	Non-Selective Fishery		

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EXECUTIVE SUMMARY

This report provides a summary of the proposed coastwide plans for mass marking (MM) of Coho and Chinook salmon and the conduct of mark-selective fisheries (MSFs) in 2014. Issues with implications for maintenance of the coastwide coded-wire tag program are identified and recommendations are proposed.

Summary of 2014 Mass Marking Proposals

Throughout this report a mass-marked fish refers to a fish with an adipose fin clip and a double-index tag (DIT) group includes two related coded-wire tag (CWT) groups, one marked and one unmarked. The terms 'marked' and 'clipped', and likewise 'unmarked' and 'unclipped', are used interchangeably.

Mass Marking and DIT Programs

Twenty-three proposals (8 for Coho and 15 for Chinook) were received for mass marking (MM) occurring in 2014 (Appendix E). Of these, one was received from southern British Columbia (BC) and 22 from southern United States (US). The Selective Fishery Evaluation Committee (SFEC) believes these proposals cover all MM programs of relevance to the Pacific Salmon Commission (PSC).

Within the MM proposals received from southern BC and southern US, approximately 34 million Coho are proposed to be mass-marked in 2014 (Table 2-1; Figure 2-1A), a level comparable to that proposed in 2013. Essentially all hatchery Coho production intended for harvest, from southern BC and southern US hatcheries will be mass marked. Currently there are 18 proposed Coho salmon DIT groups (Table 2-1), of which two will be released from southern BC, seven from Puget Sound, five from the Washington (WA) coast, and four from the Columbia River Basin. These DIT groups are unchanged from the 2013 proposals.

Approximately 119 million Chinook are proposed to be mass marked in 2014 from southern US Chinook hatcheries (Table 2-1; Figure 2-1B). This is approximately five million more than were proposed for 2013. Most all hatchery Chinook production from southern US hatcheries intended for harvest will be mass marked. Currently there are 14 proposed Chinook salmon DIT groups (Table 2-1, Appendix H), of which seven are from Puget Sound facilities, two from coastal facilities, and five from Columbia River facilities. The number of DIT groups is unchanged from the 2013 proposals, however, CDFO discontinued the Fraser River DIT with the 2011 brood and WDFW is proposing a new DIT program at Priest Rapids.

Sampling Programs

Assuming recent exploitation rates and sampling programs, the SFEC estimates the proposed mass marking of Coho stocks in 2014 will result in annual encounters of untagged marked Coho in sampling programs of approximately 300 Coho in Alaska (AK) and 4,100 Coho in Canada (Table 2-4). For southern US Chinook stocks, annual encounters of untagged marked Chinook in sampling programs are projected to be approximately 10,200 Chinook in AK, 19,000 Chinook in Canada, and 200 Chinook in California (Table 2-4).

Prior to MM, the adipose fin clip was employed as a visual indicator for fish containing a CWT. Consequently, sampling programs designed to collect heads from fish with missing adipose fins were appropriate for obtaining CWT samples. With MM, a large number of marked fish do not contain CWTs; further, CWTs must be recovered from both marked and unmarked fish to obtain data for DIT releases to estimate fishery impacts. Electronic tag detection (ETD) equipment has been developed as a means to efficiently identify marked and unmarked fish containing CWTs. However, ETD is not employed coastwide because of continuing reservations by some agencies regarding the cost, accuracy, and practical feasibility of incorporating this technology into their sampling programs. The Alaska Department of Fish and Game (ADFG), Canadian Department of Fisheries and Oceans (CDFO), Oregon Department of Fish and Wildlife (ODFW), and California Department of Fish and Wildlife (CDFW) all conduct sampling programs which will not recover the unclipped component of DIT groups required to assess impacts of MSFs. Unsampled fisheries from which unmarked DIT CWT recoveries should have been observed create gaps in analyses of fishery impacts on unmarked (wild) fish.

Considering sampling programs coastwide, some agencies already implement comprehensive electronic sampling strategies to recover CWTs from sport and commercial fisheries, while other agencies are still working to increase use of ETD. Washington State continues to fully implement electronic sampling statewide and consistently reports CWT recoveries of the unmarked components of DIT groups in their fisheries. Starting in 2008, Canada also committed to full electronic sampling and reporting of all CWTs in all commercial fisheries for Chinook. Coho in Canadian commercial fisheries are visually sampled, except for heads delivered by northern 'freezer' trollers, which are electronically sampled. Canada continues to rely on the Sport Head Recovery Program (SHRP) to recover CWTs from marked fish in NSFs and MSFs alike and thus no unmarked coded-wire-tagged recoveries are available from them. Oregon Department of Fish and Wildlife continues to use visual sampling for fall Chinook and electronic sampling for spring Chinook and Coho in the Columbia River. Beginning in 2011, ODFW initiated electronic sampling of all ocean recreational and commercial salmon fisheries off the coast of Oregon (OR).

Encounters of large numbers of mass-marked Chinook are increasingly impacting catch sampling programs in northern fisheries; for example, approximately 68% of the Chinook caught in 2013 in the southeast Alaskan troll fishery with a missing adipose fin did not contain a CWT (Figure 2-3). The increased costs to deal with the additional marked fish (e.g., storage, and shipping to and sorting of heads in the dissection laboratories) are not quantified, but will impact the programs.

A new type of wand, the "T-wand" is now available with a greater detection range. The manufacturer believes that if used correctly these wands should detect all CWTs and would no longer require "mouth-wanding" for Chinook.

Summary of 2014 Mark-Selective Fishery Proposals

MSF's have been prosecuted for Coho since 1998 and for Chinook since 2003. For 2014, the SFEC received 47 MSF proposals for Coho and Chinook salmon in CDFO, WDFW, ODFW, and ODFW fisheries. The SFEC believes these proposals cover all MSF's planned for 2014 of relevance to the PSC. Agencies provided the majority of the requested information in each of the proposals and the proposals were submitted on time. One proposal was received for a commercial Coho and Chinook MSF to occur in the lower Columbia River, 17 proposals were received for Coho Salmon MSF's, and 29 proposals were received for Chinook Salmon MSF's. Of these, two were new proposals from WDFW for Coho mark-selective fisheries in the Skagit and Samish rivers. All proposals submitted to the SFEC for review are listed in Table 3-1 (also see Appendix F). Further details describing the proposed MSF's and comments by the SFEC are provided in Table 3-2.

Up until 2008, Chinook MSF's were largely restricted to Puget Sound and Columbia River spring Chinook. Since then, Chinook MSF's have expanded substantially in marine and freshwater areas. In 2007, 12 Chinook MSF's were prosecuted; in 2010, that number doubled to 24 Chinook MSF's and a larger number of indicator stocks are now vulnerable to being encountered in MSF's.

The majority of MSF proposals are for terminal marine or freshwater areas, each of which will impact mature fish of one to several stocks. Multiple MSF's for both Coho and Chinook are also expected to occur in ocean areas in 2014 in BC, WA (WA ocean areas 1 through 4 and the Columbia River), and OR. These fisheries will impact many stocks and also multiple broods of Chinook. Table 3-4 and Table 3-5 each provide historical information on encounters of tagged and marked fish to identify Coho and Chinook tagged stocks that can be expected in these areas with MSF's.

Issues and Concerns

Post-season Reports

Post-season reports on MSF's are required for each MSF prosecuted. One of the basic functions of these reports is to provide a record of how fisheries were actually prosecuted (whether they took place) and whether there were any changes in the way the fisheries and sampling programs were conducted relative to the proposal. These reports are to be submitted in the form of two tables (Appendix I). The first table should be submitted by the annual PSC post-season meeting following the year of the fishery. No SFEC MSF post-season report tables were found in the U.S or Canadian post-season reports (Jan 2014). Although these tables are not included in the PSC post-season reports, CDFO and WDFW do provide fishery regulations and preliminary landed catch estimates for mark-selective fisheries in their country's post-season reports. In addition, post season estimates for all Chinook MSF's in all WA marine waters (Areas 1 - 13) are available in the Recreational Angling Impact Database (RAID) hosted on the NWIFC's website. WDFW has also made available reports of some of their MSF's on their website.

Mixed-Stock Regulations

Regulations to implement MSF's are increasingly complex, making analyses to estimate impacts challenging in a number of ways. As MSF's expand, different types of mixed-stock regulations are part of the MSF's proposed by Canada, Washington, and Oregon for recreational fisheries. The regulations include a range of rules that specify when and how anglers may retain various combinations of adult and juvenile marked and unmarked fish in their daily bag limits. The WFEC is not aware of reliable methods for estimating impacts on marked and unmarked fish under mixed-bag regulations and the agencies proposing these mixed-bag regulations should assist in developing the analytical tools to measure the impacts of these fisheries.

Recommendations and Issues Requiring PSC Direction

Proposal Review Process

It is recommended that the PSC request agencies to submit proposals for all potential ISTC/SMI and MSF's by November 2014, and for agencies to provide both preliminary and final post-season reports on the conduct of MSF's within the timeframe adopted by the PSC. Agencies need to prioritize these tasks so that proposals and MSF post-season reports are completed and submitted in a timely manner.

Inter-agency Coordination and Cooperation

Mass marking, double-index tagging, and CWT sampling programs continue to be inadequately coordinated to support analyses by PSC technical committees. It is also not clear that agencies are collecting adequate and necessary data to permit estimation of unmarked CWT recoveries in fisheries and escapements so that cohort reconstructions can be carried out on the unmarked component of the ISIT group releases. With the expansion of Chinook marine MSF's, the geographical range of electronic CWT sampling needs to be expanded and the number of double-index tagged stocks needs to be increased. Specifically, ETD needs to be implemented by ODFW for Oregon Columbia River fall Chinook fisheries and assignment to recover ISIT groups for Chinook indicator stocks. In addition, ISIT groups should be added for the following Chinook stocks:

- Lower Columbia River tule fall Chinook (possibly Washougal);
- Columbia River summers (Wells Hatchery);
- Snake River fall subyearlings (Lyons Ferry Hatchery);
- Willamette Spring (estimate ISIT program with electronic terminal sampling);
- North Oregon Coast (Salmon River); and,
- Mid-Oregon Coast.

The PSC should continue to support technical and policy processes to develop agreements to clarify responsibilities for maintaining a functional CWT system. these processes should build upon recommendations presented by the CWT Work Group in 2008.

[illegible]

5 Review of Value Sensitive Algorithms

5.1 Value Identifying Proposed Algorithm

In order to [illegible] the reasons of [illegible] proposed [illegible] [illegible] [illegible]

3.2 Double-Action Flip-Flops

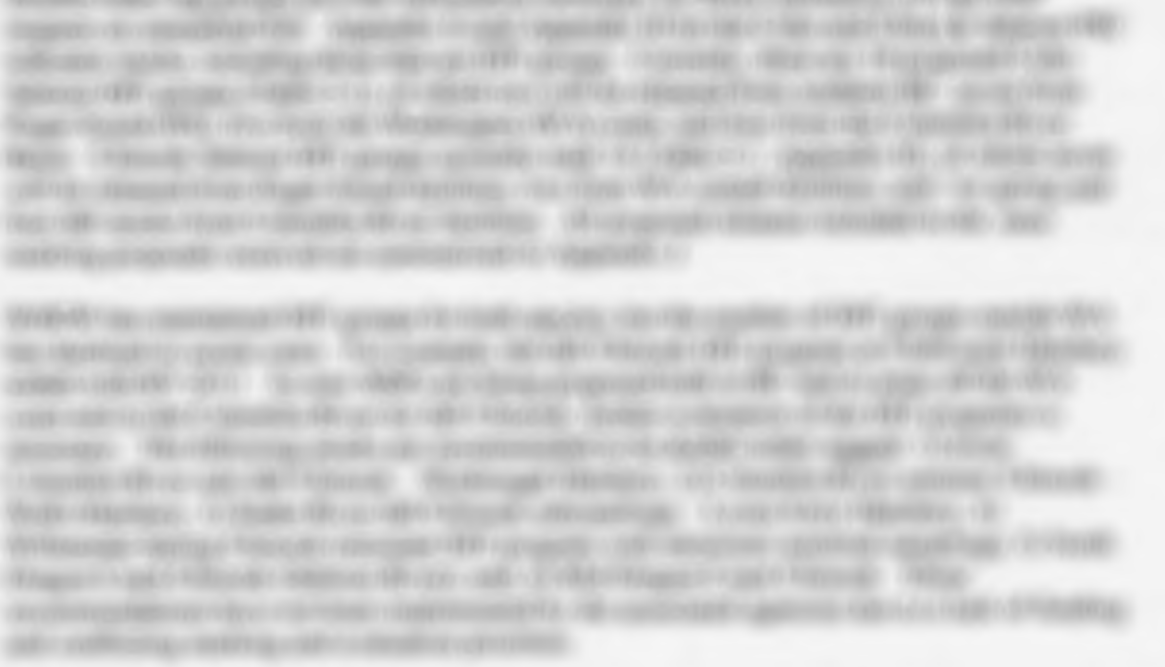

Table 2-1 Mass marking of Coho and Chinook salmon and number of DIT groups proposed for 2015 and 2016

Species	Area	Run	Agency	DIT Groups	Mass Marking (millions) 2015	Mass Marking (millions) 2016	Significant Changes from 2015
Coho	Strait of Georgia		CDFO	2	0.1	0.5	
	W. Coast of Vanc. Isl.		CDFO	0	0.0	0.0	
	Puget Sound		WDFW/Tribal	4	10.2	5.0	
			USFWS	1	0.3	0.3	
	WA Coast		USFWS	1	0.7	0.7	
			WDFW/Tribal	1	0.5	0.5	
	Columbia Basin		USFWS	1	0.5	0.8	
			WDFW	2	7.9	8.2	
			ODFW	1	0.1	0.1	
	OR Coast		ODFW	0	0.0	0.0	
	Total Coho			19	20.8	26.5	
Chinook	Lower Fraser River	Fall	CDFO	0	---	---	Discontinued with BY 2013
	Puget Sound	Spring	WDFW/Tribal	1	0.7	0.7	
		Summer	WDFW/Tribal	1	2.7	2.7	
		Fall	WDFW/Tribal	5	29.9	30.5	
	WA Coast	Spr/Sum	WDFW/Tribal	1	0.2	0.2	
		Fall	USFWS	1	1.0	2.1	
			WDFW/Tribal	2	6.2	7.0	
	Columbia Basin	Summer	USFWS	0	0.2	0.2	
		Spring	ODFW (Willamette)	0	0.3	0.0	
			ODFW (Col. R)	0	0.0	0.0	
			USFWS	0	1.2	1.2	
			WDFW/Tribal	1	2.0	5.0	
		Fall/Late	USFWS	1	10.2	10.2	
			WDFW	0	10.7	10.1	
			ODFW	1	7.9	9.1	
		Fall URB	WDFW	1	9.6	12.7	1 million increase + Priest Rapids new DIT
			ODFW	0	8.5	2.0	
			USFWS	1	5.1	9.6	
		Snake R. Fall	IDFG	0	---	0.7	Previously reported by ODFW
			ODFW	0	0.6	---	Reported by IDFG
		Snake R. Spring	ODFW	0	0.5	0.5	
			USFWS	0	1.9	1.9	
			IDFG			[2]	
	OR Coast	N. Spring	ODFW	0	0.8	0.5	
		S. Spring	ODFW	0	2.1	2.1	
		Fall	ODFW	0	2.0	1.2	
	Total Chinook			19	119.9	125.8	

[1] The proposed mass marking of fall Chinook at Irrigon Hatchery was reported by ODFW for 2015 and by both IDFG and ODFW for 2016. For 2016, the proposed numbers are listed under IDFG.

[2] Did not request or receive a proposal; however, these stocks are not expected to significantly contribute to PST fisheries.

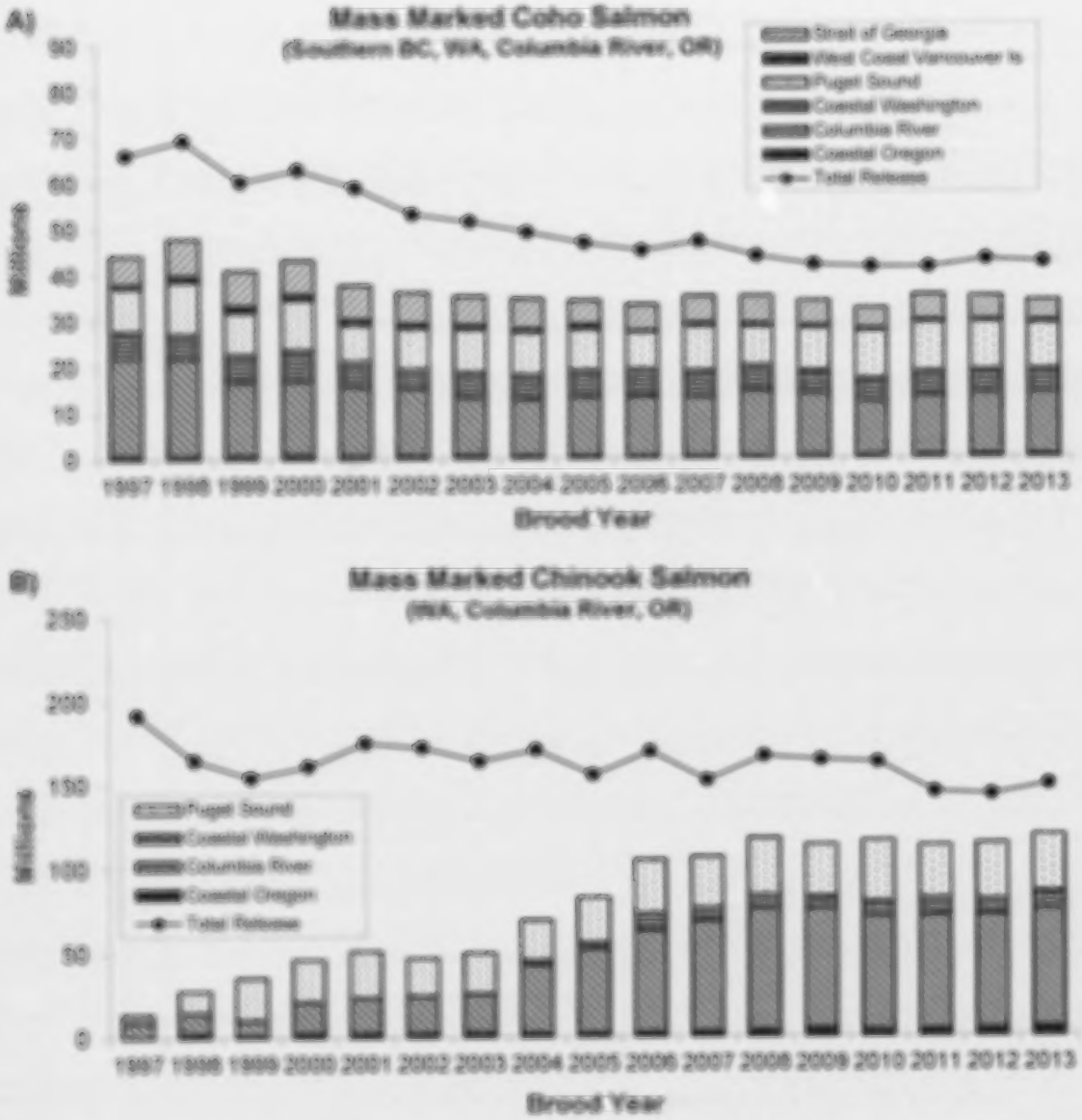

Figure 2-1. Number of mass marked Coho (panel A) and Chinook salmon (panel B) released by region and brood year, 1997–2013. The solid line represents total hatchery releases by brood year with the exception that fry releases of Coho are not included. Values used for brood years 1997–2010 are actual release sizes; values for brood years 2011–2013 are proposed release sizes. Releases of spring and summer Chinook into the Snake River by IDFG are not included in this figure for brood years 2011–2013, as no mass mark proposals were received for these programs.

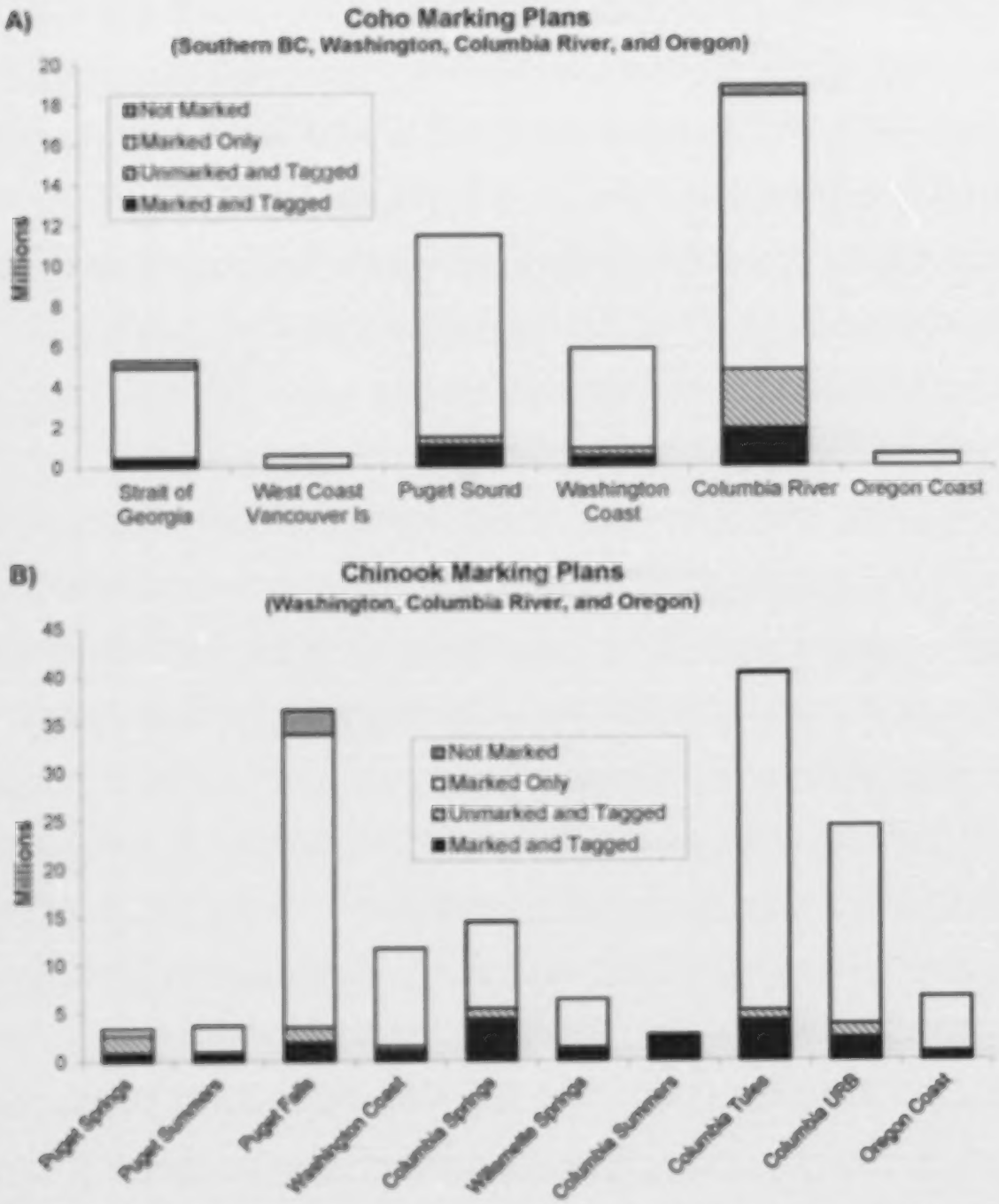

Figure 2-2. Projected Coho (panel A) and Chinook (panel B) salmon releases for brood year 2013, by region and mark status.

2.4 Fishery and Escapement Sampling Methods

2.4.1 Current Agency Sampling Methods

Two methods are currently used to detect fish containing CWTs. The traditional visual sampling method relies upon the adipose fin clip as a visual indicator for a CWT. When visual sampling is used, only CWTs from marked fish will be detected. Electronic tag detection (ETD) uses electronic gear (hand-held wand or fixed-position tube) to detect CWTs in marked and unmarked fish. During electronic sampling, every fish in the sample is scanned for the presence of a CWT. When marked fish are first visually separated in the sample and electronic gear is then used to detect tags in the marked fish, this is considered visual sampling because tags are only recovered from marked and tagged fish. Visual sampling results in a lack of recovery of the unmarked component of DIT release groups, creating data gaps in the analysis of CWT data and increased uncertainty in the estimated impacts on unmarked (wild) fish. These gaps also require indirect estimation procedures to complete them thus making analyses more time consuming and the results more uncertain.

Current coded-wire-tag sampling methods for Coho and Chinook are summarized in Table 2-2 and Table 2-3, respectively. Electronic tag detection has not been implemented for all fisheries encountering mass-marked fish. In general, ETD has become the standard CWT sampling method in WA and ID. Visual CWT sampling remains the standard method in AK and CA. In BC and OR the situation is more complex, where sampling methods depend on species, location, and the type of fishery.

Alaska Department of Fish and Game has no plans to convert to ETD sampling although there is growing concern about the large numbers of clipped fish without CWTs encountered in sampling programs. Of the marked Chinook caught in Alaska's troll fishery since the implementation of MM, the proportion of fish with no tags has increased from approximately 7% to 68% (Figure 2-3). The increased cost to deal with the additional marked fish is not quantified, but impacts the program. Costs to ship all the heads, including those with no CWTs, from sampling locations to the dissection lab are substantial.

California does not employ ETD; however, less than 200 mass-marked Chinook are projected to be encountered annually in CA (Table 2-4).

Canada relies on voluntary recoveries of marked Coho and Chinook in recreational fisheries (regardless of whether mark-selective or non-selective regulations are used), while the current restricted commercial fisheries are electronically or visually sampled depending on species and location (Table 2-2). As in AK, the CDFO SHRP program has seen an increase in the submission of heads without tags as well as a decrease in the submission rate of heads as fewer anglers turn in heads. Since 2008, Coho landed by 'ice' or 'day boats' in the northern BC troll fishery are not subject to electronic sampling. In that fishery, Coho are sampled visually and CWTs from marked fish only are recovered. Electronic sampling is being used for both species in commercial fisheries South of Cape Caution, located just northward of the northern tip of Vancouver Island on the mainland coastline.

Coded-wire-tag sampling in Oregon hatcheries is predominantly electronic; however, CWT sampling at most freshwater traps and on spawning grounds remains visual. Since 2011, ETD has been used to CWT sample both the sport and commercial troll Chinook and Coho fisheries that occur off the coast of Oregon. However, the impacts of large abundances forecasted for Sacramento and Klamath River fall Chinook combined with the 25% fractional marking program in CA could reduce sampling rates of the commercial troll fisheries when high-volume loads are encountered by samplers.

The Oregon ocean sport Chinook fishery is mostly non-selective, with the exception of a 2-week season in June between Leadbetter Pt., WA and Cape Falcon, OR. The majority of the sport Coho fishery is mark-selective; however, a limited non-selective quota fishery occurs in September from Cape Falcon to Humbug Mountain. Oregon's ocean commercial troll fishery is non-selective for Chinook and mark-selective for Coho North of Cape Falcon. From Cape Falcon southward to the OR/CA border, the commercial Chinook fishery is non-selective. Coho retention in the commercial troll fishery is prohibited from Cape Falcon to the OR/CA border.

Columbia River sport and commercial fisheries are electronically sampled for spring and summer Chinook (January–July) and also Coho. Fall Chinook (August–October) fisheries (commercial and sport) are visually sampled by Oregon (only adipose-clipped fish are wanded to determine if CWT present), except for the Buoy 10 sport fishery in the estuary where electronic sampling has been used in recent years.

Some controversy remains regarding the reliability of wands for detecting CWTs in Chinook. CDFO has adopted a policy of not using wands in either fishery or escapement sampling except when a tube detector fails or a Chinook is too large to pass through the tube detector. CDFO carried out a blind study over a 2-year period in the Fraser River Albion Chinook test fishery with trained staff using hand-held wands and found that CWTs were missed when actually present and detected when not present at a rate significantly greater than expected by chance (Parken and Riddell 2007). Most importantly, missed detections and false detections occurred at higher rates in unmarked fish compared to marked fish. However, the results of the Canadian study contradict all other previous blind studies testing the efficacy of wands in detecting CWTs in Chinook, where detection rates ranged from 91 to 99% (Olson 2007). The difference in the results of these studies is disconcerting, and it has yet to be determined whether this difference is due to sampling technique or equipment.

The manufacturer of the wands (Northwest Marine Technology, Inc.) has the ability to test and increase the detection range of wands to a new minimum standard (3.2 cm). Wands that meet this new standard are marked with a silver battery cap. The Northwest Indian Fish Commission (NWIFC) conducted a field test of these newer wands on returning Chinook at three hatcheries in the fall of 2010 (Olson 2010). The study found high detection rates (99% for all samples combined) with just external wanding. In addition, some of the missed tags were detected with subsequent wanding in the mouth. The technique of "mouth wanding" (wanding the fish both externally on the snout and inside the mouth on the palate) is therefore still recommended with these wands.

Table 2-2. Proposed fishery sampling methods for tagged Coho Salmon in 2014.

Region	Fishery	Type of Sampling	Comments
Alaska	Commercial	Visual	
	Sport	Visual	
Northern BC	Commercial	Electronic/Visual	Some terminal areas are not sampled. Freezer troll is sampled electronically; other catches are sampled visually.
	Sport	Visual (Voluntary)	Anglers are encouraged to turn in heads from marked Coho only; therefore, tag recoveries of unmarked Coho are not expected (fisheries are non-selective).
West Coast Vancouver Island	Commercial	Electronic	Incidental recoveries in fisheries on other species; non-retention of unmarked Coho.
	Sport	Visual (Voluntary)	Anglers are encouraged to turn in heads from marked Coho only; therefore, tag recoveries of unmarked Coho are not expected (fisheries are mostly mark-selective).
Strait of Georgia	Commercial	Electronic	Incidental recoveries in fisheries on other species; non-retention of unmarked Coho.
	Sport	Visual (Voluntary)	Anglers are encouraged to turn in heads from marked Coho only; therefore, tag recoveries of unmarked Coho are not expected (fisheries are mostly mark-selective).
Puget Sound	Commercial	Electronic	
	Sport	Electronic	
Washington Coast	Commercial	Electronic	
	Sport	Electronic	
Oregon Coast	Commercial	Electronic	The only commercial Coho fishery on the Oregon coast proposed to occur is North of Cape Falcon and is mark-selective; therefore, recoveries of unmarked Coho are not expected.
	Sport	Electronic	The ocean sport fishery is mark-selective except for a non-selective season during the first few weeks of September. Tag recoveries from unmarked Coho are anticipated in September.
Columbia River	Commercial	Electronic	
	Sport	Electronic	
California	Commercial	Visual	
	Sport	Visual	

Table 2-3. Proposed fishery sampling methods for tagged Chinook Salmon in 2014.

Region	Fishery	Type of Sampling	Comments
Alaska	Commercial Sport	Visual Visual	
Northern BC	Commercial Sport	Electronic Visual (Voluntary)	All Chinook are now electronically sampled and all tags are decoded (this has been the case since 2007). Anglers are encouraged to turn in heads from marked Chinook only; therefore, tag recoveries of unmarked Chinook are not expected.
West Coast Vancouver Island	Commercial Sport	Electronic Visual (Voluntary)	Anglers are encouraged to turn in heads from marked Chinook only; therefore, tag recoveries of unmarked Chinook are not expected.
Strait of Georgia	Commercial Sport	Electronic Visual (Voluntary)	Anglers are encouraged to turn in heads from marked Chinook only; therefore, tag recoveries of unmarked Chinook are not expected.
Puget Sound	Commercial Sport	Electronic Electronic	
Washington Coast	Commercial Sport	Electronic Electronic	
Oregon Coast	Commercial Sport	Electronic Electronic	CWTT funds are used to implement current electronic sampling programs.
Columbia River	Commercial Sport	Electronic/Visual Electronic/Visual	Spring and Summer Chinook fisheries are electronically sampled. Fall Chinook are visually sampled by Oregon. CWT recoveries from unmarked fall Chinook will be incomplete. Spring and Summer Chinook fisheries are electronically sampled. Fall Chinook are visually sampled by Oregon. CWT recoveries from unmarked fall Chinook will be incomplete. The Buoy 10 fishery is electronically sampled.
California	Commercial Sport	Visual Visual	

In November of 2011, Northwest Marine Technology (NMT) announced the availability of a "T-wand". T-wands are more sensitive than the previous wands and have a detection range of 5.5 cm. Field tests indicate that for most Coho and Chinook, CWTs can be readily detected with a single quick up and down swipe on the top of the snout. However, for large fish, particularly male Chinook or Coho > 1 m in length, three up and down swipes on the snout are recommended - one down the middle and one on each side of the snout. The manufacturer believes that if used correctly, these wands should detect all tags. An advantage of these wands is that mouth wanding is not required on large Chinook. These wands are now being sold to agencies and ADFG, WDFW, and ODFW all purchased wands with 2012 Coded Wire Tag Improvement Funds. CDFO carried out testing of these wands in 2013. Prior to the fish entering the processing plants, ADFG has begun to use these wands in Alaska to identify tagged fish in the marked fish that were visually sampled; thus, reducing the number of heads removed and sent to the CWT lab. NMT also believes T-wands are very durable. Of the 300 wands sold to-date, only 5 have been returned for repairs. Because of the increased sensitivity of the T-wands, WDFW and ODFW have reported that there are a few sites where they were not useable due to interference from metal structures or equipment. The manufacturer has conveyed that the sensitivity could be turned down if this was desired by the agencies.

2.4.2 Estimated Sampling Encounters

A summary of projected mass-marked Coho and Chinook salmon that may occur in agency CWT sampling programs is provided in Table 2-4.

Coho Salmon

Planned mass marking in 2014 will likely result in estimated future encounters of approximately 300 untagged and marked recoveries in AK and few encounters of untagged and marked Coho salmon in CA – the two geographical areas where Coho are not mass marked or electronically sampled. It is also projected that approximately 4,100 untagged and mass-marked Coho recoveries will occur in Canadian fisheries, some of which are visually sampled.

Chinook Salmon

Planned mass marking of southern US Chinook stocks will result in estimated mass-marked encounters of approximately 10,200 Chinook in AK, 19,000 Chinook in Canada, and 200 Chinook in CA, assuming recent exploitation rates and sampling programs. We emphasize these regions because agencies in these areas rely partially or completely on visual or voluntary sampling to recover CWTs (Table 2-3). For example, in Alaskan troll fisheries where visual sampling is employed, the proportion of marked Chinook salmon encountered that is untagged has been much greater in recent years (Figure 2-3).

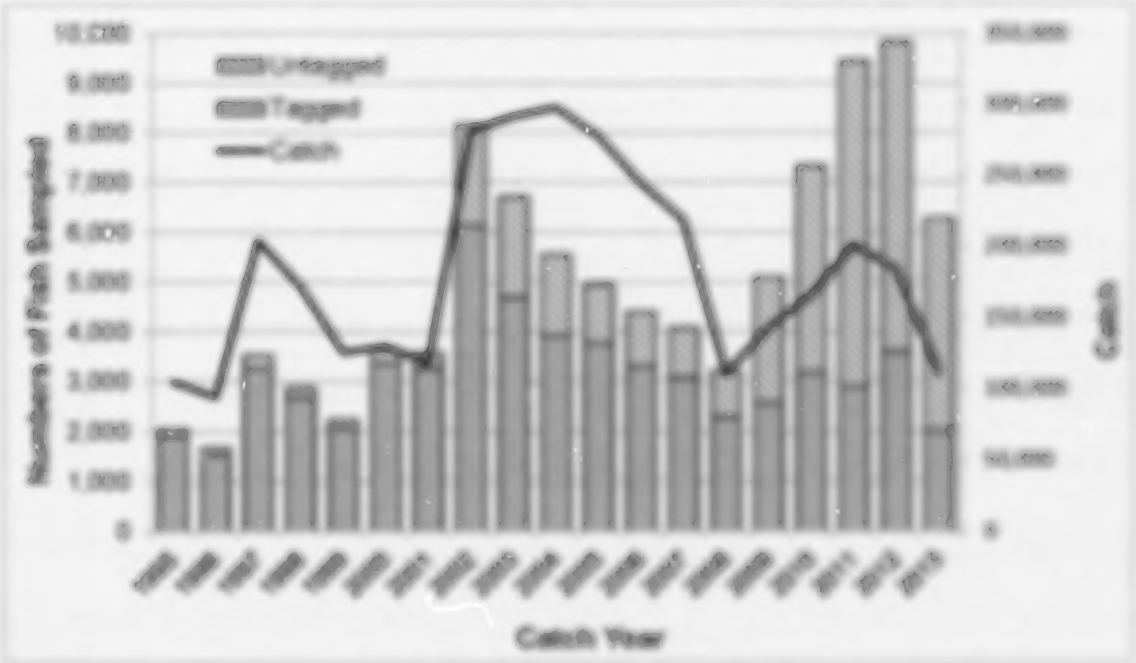

Figure 2-1. Numbers of marked Chinook Salmon sampled in Alaska's troll fishery by unmarked and tagged status, with catch numbers, 1995–2013.

Table 2-4 Numbers of mass-marked Coho and Chinook projected to be encountered in future CWT sampling programs (actual number of fish encountered in samples will depend on survival rates, exploitation rates, and sampling rates). For this analysis, CWT recoveries from the following brood years were used: 2005–2007 for Coho and 2003–2005 for Chinook. Tribal hatchery mass-marked production in WA is included in the WDFW numbers.

Species	Area/Run	Hatchery	Proposed 2012 MM	Estimated Encounters in Future Fishery Sampling Programs													
				Alaska		Yukon		NBC		W.V.I. (US)		Columbia R.		OR Coast		California	
				Low	Hi	Low	Hi	Low	Hi	Low	Hi	Low	Hi	Low	Hi	Low	Hi
Coho	Strait of Georgia																
	W. Coast of Can. Island																
	Puget Sound																
	WA Coast																
	Columbia River																
	OR Coast																
			Total														
Chinook	Puget Sound	Spring															
		Summer															
		Fall															
	WA Coast	Spr/Sum															
		Fall															
	OR Coast	S. Spr															
		S. Sp															
		Fall															
	Columbia River	Spring															
		Summer															
		Fall-Tule															
		URB															
	Snake River	Fall															
		Spring															
			Total														

[illegible]

Table 5-1. Status of multi-sector/co fishery (MSF) proposals, fishery implementation, and post-fishery reporting for years 2003 through 2014

"P" indicates the MSF proposal was submitted to the PSC-SFEC by the requested deadline. "F" indicates the MSF was conducted. "R" indicates the post-season report summarizing MSF results was submitted successfully to the PSC-SFEC. An "O" (third character) indicates that the post-season MSF report is still outstanding (i.e., SFEC has not yet received the report). An "X" indicates that a MSF proposal was not submitted to SFEC (first character) or the MSF was not conducted (second character). Finally, "-" indicates the MSF was neither proposed nor conducted in a given year.

Fishery Name (SFEC Proposal ID)	Catch Year[1]											
	2002	2003	2004	2005	2006[2]	2007	2008	2009	2010	2011	2012	2013
Targeting Method 6 (dsc and 6 trawl)												
Commercial, Lower Columbia R. (MSF-COLR/W/DR/W-07)[3]											PRO	P
Targeting Method 6 (dsc)												
Sport, Southern BC marine and freshwater (MSF-BOC-02)	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	P
FSC, Lower Fraser R. (MSF-BOC-03)	-	-	-	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	P
Commercial, Southern BC marine (MSF-BOC-05)	-	PX	PRO	PRO	XPO	PRO	PX	PRO	PRO	PRO	PRO	P
Sport, Lower Fraser R. (MSF-BOC-06)	XPR	XPR	XPR	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	P
Sport, Puget Sound Area 7-13 (MSF-WDFW-07)	XPR	PRO	PRO	PRO	XPR	PRO	PRO	PRO	PRO	PRO	PRO	P
Sport, Nooksack R. (MSF-WDFW-09)	XPO	XPO	XPO	XPO	XPO	XPO	PRO	PRO	PRO	-	-	-
Sport, Skagit River (MSF-WDFW-10)												P
Sport, Samish River (MSF-WDFW-11)												P
Sport, W. Area 1-4 and Bays (1) (MSF-WDFW-08)	PRO	PRO	PRO	PRO	XPR	PRO	PRO	PRO	PRO	PRO	PRO	P
Commercial, W. Area 1-4 (MSF-WDFW-12)	XPO	XPO	XPO	XPO	XPO	PRO	PRO	PRO	PRO	PRO	PRO	P
Sport Quillayute R. (MSF-WDFW-21)	XPO	XPO	XPO	XPO	XPO	XPO	XPO	PRO	PRO	PRO	PRO	P
Sport, Grays Harbor tributaries (MSF-WDFW-24)	XPO	XPO	XPO	XPO	XPO	XPO	XPO	PRO	PRO	PRO	PRO	P
Commercial, Grays Harbor Area 2C (MSF-WDFW-28)	-	-	-	-	-	-	XPO	XPO	PX	-	-	
Sport, Grays Harbor Area 2-2 (MSF-WDFW-27)	-	-	-	-	-	-	-	PRO	PRO	PRO	PRO	P
Sport, Willapa tributaries (MSF-WDFW-23)	XPO	XPO	XPO	XPO	XPO	XPO	XPO	PRO	PRO	PRO	PRO	P

[1] Catch year 2002 was the first year SFEC received requested MSF proposals from sponsors. Some Coho MSFs began as early as 1998.
[2] Summary of MSFs are available for most of these fisheries for catch years 2003–2009 in SFEC 2012 (http://www.psc.org/pubs/SFEC%2012-1.pdf).
[3] Original MSF-COLR/W/DR/W-07 was originally submitted as MSF-COLR/W-06 in 2011 but the proposal ID was changed to continue the post-proposal numbering sequence.

Table 3–1. (Continued) Status of mark-selective fishery (MSF) proposals, fishery implementation, and post-fishery reporting for years 2003 through 2013.

Fishery Name (SFEC Proposal ID)	Catch Year[1,2]											
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Targeting Marked Coho (continued)												
Sport, Willapa Bay Area 2.1 (MSF-WDFW-29)[3]	-	-	-	-	-	-	-	PFO	PFO	PFO	PFO	P
Sport, Lower Columbia R (MSF-ODFW/WDFW-04)	XFR	XFR	XFO	XFO	XFO	PFO	PFO	PFR	PFO	PFO	PFO	P
Commercial, Lower Columbia R (Buoy 10 to Beacon Rock) (MSF-ODFW/WDFW-06)	-	-	-	-	-	-	-	-	-	-	PFO	P[4]
Sport, Oregon coast (MSF-ODFW-03)	XFR	XFR	XFO	XFO	XFO	XFO	XFO	PFR	PFR	PFR	PFR	P
Targeting Marked Chinook												
Sport, Strait of Juan de Fuca subareas, BC (MSF-FOC-07)	-	-	-	-	-	XFO	PFO	PFR	PFO	PFO	PFO	P
Sport, WCVI subareas, mainly inside (MSF-FOC-08)	-	-	-	-	-	-	PX	-	PX	-	-	-
Sport, Puget Sound Areas 5&6, summer (MSF-WDFW-02)	PFR	PFR	PFR	PFR	PFR	PFR	PFR	PFR	PFR	-	-	-
Sport, Puget Sound Areas 9-13, summer (MSF-WDFW-11)	-	-	-	-	PFR	PFR	PFR	PFR	PFR	-	-	-
Sport, Puget Sound Areas 5-13, summer (MSF-WDFW-35; combines proposals 02 and 11 as of 2012)	-	-	-	-	-	-	-	-	-	PFR	PFR	P
Sport, Puget Sound Areas 5-13, winter (MSF-WDFW-36; replaces 16 as of 2012; old proposal 08 [Area 8-1/8-2 Winter MSF] combined into 16 in 2007)	-	-	PFR	PFR	PFR	PFR	PFR	PFR	PFR	PFR	PFR	P
Sport, Nooksack R (fall run) (MSF-WDFW-13)	-	PFO	PFO	PFO	PFO	PFO	PFR	PFR	PFO	PFO	PFO	P
Sport, Upper Skagit R (spring run) (MSF-WDFW-12)	-	-	XFO	XFO	PFO	PFO	PFO	PFR	PFO	PFO	PFO	P
Sport, Skykomish R (summer run) (MSF-WDFW-01)	PFO	PFO	XFO	XFO	PFO	PFO	PFR	PFR	PFO	PFO	PFO	P
Sport, Snohomish R (summer run) (MSF-WDFW-37)	-	-	-	-	-	-	-	-	-	-	PX	P
Sport, Puyallup & Carbon R (fall run) (MSF-WDFW-09)	XFO	XFO	PFO	PFO	PFO	PFO	PFO	PFO	PFO	PFO	PFO	P
Sport, Nisqually R (fall run) (MSF-WDFW-14)	-	-	XFO	XFO	PFO	PFO	PFO	PFO	PFO	PFO	PFO	P
Sport, Skokomish R (fall run) (MSF-WDFW-20)	-	-	-	-	-	-	PX	PFO	PFO	PFO	PFO	P
Sport, WA areas 1-4 (MSF-WDFW-19)	-	-	-	-	-	-	PX	PFR	PFR	PFR	PFR	P

[1] Catch year 2003 was the first year SFEC received requested MSF proposals from agencies. Some Coho MSFs began as early as 1998.
[2] Summary of MSFs are available for many of these fisheries for catch years 2005–2009 in SFEC 2012 (http://www.psc.org/pubs/SFEC12-1.pdf)
[3] Prior to September, MSFs within the Willapa Bay are included in the MSF-WDFW-06.
[4] Proposal **MSF-ODFW/WDFW-06** was originally submitted as **MSF-ODFW-05** in 2013 but the proposal ID was changed to continue the joint proposal numbering sequence.

Table 3–1. (Continued) Status of mark-selective fishery (MSF) proposals, fishery implementation, and post-fishery reporting for years 2003 through 2013.

Fishery Name (SFEC Proposal ID)	Catch Year[1,2] 2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Targeting Marked Chinook (continued)												
Troll, WA areas 1-4 (MSF-WDFW-21)	-	-	-	-	-	-	PX	PX	-	-	-	-
Sport, Quillayute R (spr/summer run) (MSF-WDFW-32)	XFO	XFO	XFO	XFO	XFO	XFO	XFO	XFO	PFO	PFO	PFO	P
Sport, Hoh R (MSF-WDFW-33)	-	-	-	-	-	XFO	XFO	XFO	PFO	PFO	PFO	P
Commercial, Grays Har. 2A,2B,2C,2D (MSF-WDFW-38)	-	-	-	-	-	-	-	-	-	-	PFO	P
Commercial, Willapa Bay (MSF-WDFW-25)	-	-	-	-	-	-	-	PFO	PFO	PFO	PFO	P
Sport, Willapa Bay Area 2.1 (MSF-WDFW-26)	-	-	-	-	-	-	-	PFO	PFO	PFO	PFO	P
Sport, Willapa Bay tributaries (fall run) (MSF-WDFW-27)	-	-	-	-	-	-	-	PFO	PFO	PFO	PFO	P
Sport, Lower Grand Ronde R (spring run) (MSF-WDFW-39)	-	-	-	-	-	-	-	-	-	-	PX	P
Sport, Yakima R (spring run) (MSF-WDFW-03)	-	PFO	-	-	-	PFR	PX	PFR	PFO	PFO	PFO	P
Sport, Snake R (fall run) (MSF-IDFG-04)	-	-	-	-	-	-	XFO	XFO	XFO	PFO	PFO	P
Sport, Snake R (spring run) (MSF-WDFW-28)	-	-	-	-	-	-	-	PFO	PFO	PFO	PFO	P
Sport, Lower Snake R (fall run) (MSF-WDFW-05)	-	-	-	-	-	XFO	PFR	PFO	PFO	PFO	PFO	P
Sport, Lower Columbia R (spring run) (MSF-ODFW/WDFW-01)	PFO	PFO	PFO	XFO	XFO	PFO	PFR	PFO	PFO	PFO	PFO	P
Sport, Columbia R (sum. run) (MSF-ODFW/WDFW-02)	PFO	PFO	PX	XFO	-	PFO	PX	PFO	PFO	PFO	PFO	P
Commercial, Lower Columbia R (spring run) (MSF-ODFW/WDFW-03)	PFO	PFO	PFO	XFO	XFO	PFO	PFR	PFO	PFO	PFO	PFO	P
Sport, Columbia R (fall run) (MSF-ODFW/WDFW-05)	-	-	-	-	-	-	PX	PX	PFO	PFO	PFO	P
Sport, Willamette R (spring run) (MSF-ODFW-01)	PFR	PFR	PFO	PFO	XFO	PFR	PFR	PFR	PFO	PFO	PFO	P
Sport, Oregon coast (fall run) (MSF-ODFW-02)	-	-	-	-	-	XFO	PFO	PFR	PFR	PFR	PFR	P

[1] Catch year 2003 was the first year SFEC received requested MSF proposals from agencies. Some Coho MSFs began as early as 1998.
[2] Summary of MSFs are available for many of these fisheries for catch years 2005–2009 in SFEC 2012 (http://www.psc.org/pubs/SFEC12-1.pdf)

3.2 Evaluating MSF Proposals

The SFEC-AWG employs a two-stage approach to summarize the results of its evaluation of MSF proposals. First, each proposal is characterized in regard to the following eight categories (Table 3-2):

1) Fishery regulation
2) CWT sampling method
3) CWT detection method
4) CWT composition estimation method
5) Alignment of time/area strata boundaries of regulations and catch estimation and CWT sampling programs
6) Catch estimation by size/mark/retention status
7) Indicator stocks expected to be impacted by the fishery
8) DIT release groups expected to be impacted by the fishery

Alternative characteristics for each category are listed by codes and described in Table 3-2. For example, Table 3-2 lists three possible characteristics for the first category (Fishery Regulation) including "MSF", "Mark-mixed bag", and "Mark and size-mixed bag".

Second, each MSF proposal is assigned a Green-Yellow-Red level of concern for each characteristic (green- no concern, yellow- moderate concern, red- major concern). Table 3-3 presents the results of the evaluation. Each colored cell contains codes referencing the descriptions of characteristics provided in Table 3-2. For instance, if a particular proposal involved a Mark-mixed bag fishery, then for the category Fishery Regulation, the numeric index for that characteristic (2) was entered in the column labeled Fishery Regulation. Further, since Mark-mixed bag fisheries generally pose challenges for estimation of fishery impacts, the cell would be colored yellow or red, the chosen color depending on other qualifiers such as the magnitude of the fishery. Table 3-3 also includes narrative columns to provide additional information regarding the nature of concerns identified by SFEC.

Table 3-2. List of characteristics that describe proposed MSFs, organized by Subject Category. This table is used as a reference table by Table 3-3.

Subject Category	Characteristic	How the Characteristic Influences Evaluation of MSF Impacts	Concern for Evaluation of Fishery Impacts on Indicator Stocks
Fishery Regulation: mark-bag limit type	1) MSF (i.e., for mark-selective species, only marked fish can be retained)	The regulation influences what method needs to be used to estimate mortalities by size and mark status.	Note that SFEC has not been able to develop direct means to allocate non-landed mortalities under mixed-bag regulations.
	2) Mark-mixed bag limit (i.e., for mark-selective species, a portion of total bag limit can be unmarked)		
	3) Mark and size-mixed bag limit (size-range-specific allowances for retention of unmarked fish)		
CWT Sampling Method	1) Direct sample in creel surveys and dockside sampling programs.	Direct sampling programs are statistically designed programs in which technicians collect information.	If sample expansions are not available due to lack of total catch estimates in direct sampling no estimate of CWTs recovered by fishery can be made.
	2) Voluntary Recovery Program - fishers submit heads, e.g., in BC sport fishers send in heads from clipped fish.	For the voluntary recovery program it is necessary to estimate the total CWT recoveries from an estimated submission rate.	Submission rate estimation depends on a catch estimation program that estimates total clipped catch. If this is unavailable, submission rates from other areas or periods have to be used, potentially biasing estimates of CWT recoveries.
	3) No CWT sampling	Proxy will be needed.	

Table 3-2 (Continued) List of characteristics that describe proposed MSFs, organized by Subject Category. This table is used as a reference table by Table 3-3.

Subject Category	Characteristic	How the Characteristic Influences Evaluation of MSF Impacts	Concern for Evaluation of Fishery Impacts on Indicator Stocks
1. CWT Detection Method	(1) Electronic detection will be implemented. All fish (marked and unmarked) will be checked for CWT using electronic gear (wands, tube detectors)	Electronic detection will result in enumeration of all tagged fish in the sample, both unclipped and clipped	
	(2) Visual detection will be implemented. All adipose fin-clipped (marked) fish in sample are checked for tags, but unmarked fish in the sample are not	Visual detection results in enumeration of tagged and marked fish only. Any unmarked and tagged fish will not be detected	Unmarked and tagged fish in the fishery will not be sampled and estimates of total CWT recoveries will be biased. Sufficient recoveries of both unmarked but tagged ORF and conservation groups
2. CWT Composition Estimation Method	(1) Standard method using CWTs sampled from fishery.	Estimates of CWT recoveries in fisheries and escapement are used for cohort analyses, estimation of exploitation rates and other stock parameters	
	(2) Non-standard or Indirect, using CWT rates from proxy (i.e., hatchery or fishery, where relationship has been established)		If estimates of total CWT recoveries are biased all CWT based estimates will also be biased
	(3) Non-standard or Indirect, with poorly or unestablished proxy		
	(4) None proposed		If no CWT estimates are made all CWT based estimates will be biased

Table C-1 [illegible] [illegible] [illegible]

Table 3-2 (Continued) List of characteristics that describe proposed MSF's, organized by Subject Category. This table is used as a reference table by Table 3-3.

Subject Category	Characteristic	How the Characteristic Influences Evaluation of MSF Impacts	Concern for Evaluation of Fishery Impacts on Indicator Stocks
Are CWT indicator stocks expected to be impacted in the fishery?	0) No, CWT indicator stocks are not expected	Estimate anticipated stock-age-specific encounters of coded-wire-tagged fish in the fishery. Determine potential significance of MSF to indicator stocks.	Lack of information to determine potential significance of MSF to indicator stocks.
	1) Yes, CWT indicator stocks are expected, *and* a complete list of indicator stocks was provided.		
	2) Yes, CWT indicator stocks are expected, *and* an incomplete list of indicator stocks was provided.		
	3) Yes, CWT indicator stocks are expected, but a list of indicator stocks was not provided.		
Are double-index-tagged (DIT) fish expected to be impacted in the fishery?	0) No, DIT stocks are not expected.	Estimate anticipated stock-age-specific encounters of DIT fish in the fishery. Determine potential significance of MSF to DIT stocks.	Lack of information to determine potential significance of MSF to DIT indicator stocks.
	1) Yes, DIT stocks are expected, and a complete list of DIT stocks was provided.		
	2) Yes, DIT stocks are expected, and an incomplete list of DIT stocks was provided.		
	3) Yes, DIT stocks are expected, but a list of DIT stocks was not provided.		

Table 3-3. Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Color coding key:

#	Of least concern to SFEC as an issue in the MSF proposal
#	Of moderate concern to SFEC as an issue in the MSF proposal
#	Of most concern to SFEC as an issue in the MSF proposal

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Coho & Chinook Salmon												
MSF-ODFW / WDFW-07 **NEW**	Columbia R. Mouth upstream to Bonneville Dam. (Fall)	Commercial Purse seine & Beach seine	1	1	1	1	1	1	1	1	Directed MSF Chinook fishery with incidental MSF Coho retention.	Random onboard monitoring will record encounters by mark and size status. Catch estimates from fish tickets. Electronic sampling of landings for CWTs.
Coho Salmon												
MSF-FOC-02	BC Management Areas 11-29, outer areas of 121-127.	Pre-terminal and Terminal Recreational (MSF)	1	2	2	1	2	2,4	1	1	Voluntary recovery program will not provide recoveries of unmarked and tagged fish in any fishery. Low CWT submission rates.	Total catch using creel surveys in some areas and times and log books from lodges. No catch estimate for area/times with no creel or lodge logbook
MSF-FOC-02	BC Management Areas 11-29	Terminal Recreational, (Mixed Bag)	2	2	2	1	2	2,4	1	1	Voluntary recovery program will not provide recoveries of unmarked and tagged fish in any fishery. Low CWT submission rates.	Total catch using creel surveys in some areas and times and log books from lodges. No catch estimate for area/times with no creel or lodge logbook

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Coho Salmon (continued)												
MSF-FOC-03	Lower Fraser River	Terminal, First Nations (Mixed Bag)	1	3	2	4	1	2	1	0,1	This fishery is mixed bag because unmarked Coho that are mortally wounded or dead can be retained. Low CWT submission rates. Numbers of ad-clipped and unclipped Coho are reported in some fisheries.	Total catch estimate using creel survey or census.
MSF-FOC-05	BC Management Areas 23-27, 121-127	Pre-terminal Commercial (MSF)	1	1	1	1	1	1	1	1		Total catch is from fisher reported log books and phone-in catch reports.
MSF-FOC-06	Lower Fraser River	Terminal Recreational (MSF)	1	2	2	1	2	2	1	0,1	Voluntary submission of samples from clipped fish, but fishery is fully mark selective. Creel surveys and awareness factors for some times and areas.	Catch estimates from creel surveys. CWT estimation for areas/times with no catch estimation program relies on submission rates in other strata.
MSF-WDFW-06	Ocean Areas 1-4 & Col R Buoy 10	Recreational	1	1	1	1	1	1	1	1		Catch estimate from creel surveys, based on an effort/CPUE survey with boat exit counts and exit interviews. Stratified by boat type (private or charter boats) and day type (weekend or weekdays). On-water encounter rates and mark rates obtained from charter ride-along trips and voluntary trip reports (VTRs).

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Coho Salmon (continued)												
MSF-WDFW-07	Puget Sound Areas 5-13	Recreational	1	1	1	1	1	1	1	1		Total catch estimates from CRCs, and creel surveys in some areas. On-water encounter rates and mark rates obtained from VTRs and dockside samplers.
MSF-WDFW-15	Ocean Areas 1-4	Commercial Troll	1	1	1	1	1	2	1	1	No estimates of encounters or mark rate.	Catch estimates from fish tickets.
MSF-WDFW-22	Willapa tributaries (North, Smith, Willapa, Niawiakum, Palix, Nemah, Naselle, Bear)	Recreational	1	1,3	1	3	2	2	1	1	There will be a problem in estimating CWT composition of mortalities due to mark and size-mixed bag regulation. Dockside sampling for CWTs in September only; therefore, CWT sampling and estimation is not uniform across fishery regulation period.	Total catch is estimated using CRCs. Mark rates obtained from estimates of total escapement. CWT estimates depend on tag ratios and total escapement estimate.
MSF-WDFW-23	Grays Harbor, Marine Area 2.2	Recreational	1	1,3	1	3	2	2	1	1	There will be a problem in estimating CWT composition of mortalities due to mark and size-mixed bag regulation. Dockside biological sampling Sept-Oct but none in Nov-Jan. CRC for effort estimates.	Total catch is estimated from CRCs. Estimate mark rate from VTRs and commercial fishery. CWT estimates depend on tag ratios from commercial fishery.

Table 3-3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSF's proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Objectives	Catch Estimation	Indicator Stocks	SEF Stocks	Comments and Concerns	Methods of Estimation
Coho Salmon (continued)												
MSF-WDFW-14	Grays Harbor tributaries (Chehalis, EB, Hoquiam, Humptulips, Johns, Newaukum, Satsop, Wynoochee, Skookumchuck, Van Winkle, Wishkah, Wynoochee)	Recreational	1	1	1	1	1	3	1	1	There will be a problem in estimating CWT composition of mortalities due to mark and size retention regulations. Some direct sampling in Lower Chehalis only; indirect CWT sampling via electronic sampling of escapement.	Trend catch is estimated using CWTs. Mark rates obtained from estimates of total escapement. CWT estimates depend on tag ratios and total escapement estimates.
MSF-WDFW-29	Willapa Bay, Marine Area 11	Recreational	1	1	1	1	1	3	1	1	There will be a problem in estimating CWT composition of mortalities due to mark and size retention regulations.	Angler surveys and CWTs to get mark rate and sublegal proportion. Direct electronic sampling for CWTs.
MSF-WDFW-31	Quillayute R system (Dogachat, Calawah, Dickey, Quillayute, Sol Duc)	Recreational	1	1	1	1	3	3	1	1	There will be a problem in estimating CWT composition of mortalities due to mark and size retention regulations. Lack of direct sampling, instead CWT composition from electronic sampling in what are fishery is used.	Trend catch is estimated using CWTs. Mark rate estimates obtained from commercial fishery.

Table 1-1 [illegible] summary of [illegible] evaluation of [illegible] and [illegible] proposed for the [illegible] season, for which proposals were submitted to [illegible] (see Table 1-2 for definitions of numeric codes)

Proposal No.	Location	Fishery Type	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Comments and Concerns	Methods of Enhancement
[illegible]														
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 2.1-1 [illegible]

Designation	Location	Status	[illegible]	Comments and Concerns	Summary of Response
Public Health Considerations					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cultural Values					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 3-3 (Continued) Summary of SFEC's evaluation of Coho and Chinook MSF's proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes)

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Shipment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Chinook Salmon (continued)												
MSF-WDFW-09	Puyallup / Carbon River	Recreational	0	1	0	2	0	2	0	0	Lack of direct sampling, only indirect CWT estimates, via electronic sampling at hatchery. There are substantial Chinook freshwater sport fisheries, averaging 1,000 and 400 fish in the Puyallup and the Carbon.	Catch estimates from catch record cards. Indirect estimates of CWTs via electronic sampling at hatchery & associated tribal net fisheries.
MSF-WDFW-12	Upper Skagit River (Spring Chinook)	Recreational	0	1	0	2	0	2	0	0	Due to lack of direct sampling CWT electronic sampling at hatchery will be used for indirect estimates of CWTs impacted in fishery. If there is a CWT survey in the fishery, then a direct estimate would be made using CRC estimates. Also release by anglers interviewed would be available to estimate mark rate and total encounters.	Catch estimates from catch record cards. Some angler interviews for CWT sampling and biological data
MSF-WDFW-10	Nooksack River	Recreational	0	1	0	1	0	2	0	0	Lack of direct sampling. This is a small fishery, with a five year average of 50 fish kept.	Catch estimates from CRC's. Estimate number of Summit fall Chinook using % hatchery from spawning grounds and tag rate from hatchery.
MSF-WDFW-11	Nisqually River	Recreational	0	0	0	0	0	2	0	0	Creel surveys were conducted for 7 years but are no longer funded. CWT sampling is conducted in the Nisqually MSF. As this is an indicator and a DIT program, it is recommended that CWT sampling continued.	Catch estimates from CRC.

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Chinook Salmon (continued)												
MSF-WDFW-19	Ocean Areas 1-4	Recreational	1	1	1	1	1	1	1	1		Catch estimate from creel survey, based on an effort/CPUE survey with boat exit counts and exit interviews. Stratified by boat type (private or charter boats) and day type (weekend or weekdays). On-water encounter rates (by mark status/size) obtained from charter ride-along trips and VTRs.
MSF-WDFW-20	Skokomish River	Recreational	1	1	1	1	1	2	1	1	Creel surveys were conducted for 3 years but are no longer funded. CWT sampling is conducted in the Skokomish MSF. As this is an indicator and a DIT program, it is recommended that CWT sampling continue, even if the creel survey for total estimates is not implemented.	Catch estimates from CRC.
MSF-WDFW-25	Willapa Bay 2K,2M,2N,2R,2T,2U - (new area designations for 2G, 2H, 2J, 2K, and 2M)	Commercial	1	1	1	1	1	1	1	1	Live boxes are used and the condition of released unmarked and marked Chinook and Coho are recorded.	Catch from fish tickets. Standard CWT estimates.
MSF-WDFW-26	Willapa Bay MA2.1	Recreational	3	1	1	1	2	2	1	2	There will be a problem in estimating CWT composition of mortalities due to mark and size-mixed bag regulation. There is a mismatch between fishery regulation and sampling/catch estimation strata boundaries.	Catch estimates from CRCs. Angler surveys provide data needed to estimate CWT ratios and mark rates; additionally, VTRs provide data to estimate size/mark status of encounters.

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Chinook Salmon (continued)												
MSF-WDFW-27	Willapa Tributaries (Willapa, Niawiakum, Palix, Nemah, Naselle, Bear)	Recreational	3	1	1	1	1	1	1	1	There will be a problem in estimating CWT composition of mortalities due to mark and size-mixed bag regulation.	Catch estimates from CRC. Mark rates and tag ratios from hatchery and spawning ground data.
MSF-WDFW-28	Lower Snake R (spring)	Recreational	1	1	1	1	1	1	1	1		Catch and mark rate estimated using creel survey. Sampling for CWTs using electronic tag detection; standard CWT estimation methods.
MSF-WDFW-32	Quillayute River system (Bogachiel, Calawah, Dickey, Quillayute, and Sol Duc)	Recreational	3	3	1	3	3	2	0	0	There will be a problem in estimating CWT composition of mortalities due to mark and size mixed bag regulation. Estimates of CWTs are made using hatchery and tribal net estimates of CWT composition. There are no data evaluating this method for the coastal fisheries.	Catch estimates from CRC. CWT ratios and mark rates from tribal net fishery.
MSF-WDFW-33	Hoh River system	Recreational	3	3	1	3	3	2	0	0	There will be a problem in estimating CWT composition of mortalities due to mark and size mixed bag regulation. Estimates of CWTs are made using hatchery and tribal net estimates of CWT composition. There are no data evaluating this method for the coastal fisheries.	Catch estimates from CRC. CWT ratios and mark rates from tribal net fishery.

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Chinook Salmon (continued)												
MSF-WDFW-35	All Puget Sound Areas 5–13 (summer)	Recreational	1	1	1	1	1	1	1	1		Total catch estimates from creel surveys and CRCs. On-water Chinook encounter rates, estimated via test fisheries and/or VTRs, provide estimates of encounters by size and mark status.
MSF-WDFW-36	All Puget Sound Areas 5–13 (winter)	Recreational	1	1	1	1	1	1	1	1		Total catch estimates from creel surveys and CRCs. On-water Chinook encounter rates, estimated via test fisheries and/or VTRs, provide estimates of encounters by size and mark status.
MSF-WDFW-37	Snohomish River (mouth to confluence of Skykomish and Snoqualmie rivers, including all channels.)	Recreational	1	3	1	3	1	1	1	1	Lack of direct sampling; only indirect CWT estimates, via electronic sampling at hatchery. No study indicating quality of proxy.	Creel surveys will estimate releases by size and mark status.
MSF-WDFW-38	Grays Harbor 2A, 2B, 2C, 2D	Commercial	1	1	1	1	1	1	1	1	Live boxes are used and the condition of released unmarked and marked Chinook and Coho are recorded.	Catch from fish tickets. Standard CWT estimates.
MSF-WDFW-39	Lower Grande Ronde R	Recreational	1	1	1	1	1	1	1	0		Catch and mark rate estimated using creel survey. Sampling for CWTs using electronic tag detection; standard CWT estimation methods.

Table 3–3 (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Organization	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Adjustment	Catch Estimation	Index for Stocks	MT Stocks	Comments and Concerns	Methods of Estimation
Chinook Salmon (continued)												
MSF-ESFG-04	Lower Clearwater River, Snake River and lower Salmon River	Recreational	3	3	3	3	3	3	3	3		Legal and released catch will be estimated by clip and non-clipped category using stratified on-ramp creel and effort surveys. Creel surveys will also collect CWT samples.
MSF-LRFW / SCFW-01	Columbia R. Mouth upstream to McNary Dam, and Rougiel Hatchery Area	Recreational	3	3	3	3	3	2	3	3	There is no information on whether and how release number, mark and race status will be obtained.	Creel survey and CRC provide estimates of catch. Aerial surveys provide effort counts. Standard methods used for CWT estimates. Mark rates are observed at Bonneville Dam, after the lower river fishery.
MSF-LRFW / SCFW-02	Columbia R. Mouth upstream to Chief Joseph Dam	Recreational	3	3	3	3	2	2	3	3	Creel census below McNary does not cover the whole fishery, which extends to Priest Rapids; therefore, effort estimate will be underestimated. There is no information on whether and how release number, mark and race status will be obtained.	Creel survey and CRC's provide estimates of catch. Aerial surveys provide effort counts. Standard methods used for CWT estimates. Mark rates are observed at Bonneville Dam, after the lower river fishery.

Table 1-1 [illegible] Summary of [illegible] evaluation of [illegible] proposed for the [illegible] season. For which proposals were submitted by agencies in the [illegible] see Table 1-2 for definitions of numeric codes.

Proposal ID	Location	Project Type	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Comments and Concerns	Methods of Evaluation
[illegible]													
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 3-1-1 [illegible]

| [illegible] | [illegible] | [illegible] |

3.3 Expected Encounters of CWT Indicator Stocks in MSFs

Multiple MSF's are expected to occur during 2014 in BC, WA, and OR. Table 3-4 and Table 3-5 were constructed using historical information on encounters of tagged and marked fish to identify tagged stocks of Coho (brood years 2003–08, Table 3-4) and Chinook (catch years 2006–10, Table 3-5) that can be expected to be encountered in these areas with MSF's.

Tagged Coho stocks expected to be encountered are included in Table 3-4, all of which are used by the CoTC for their analyses. Mark-selective fisheries in Puget Sound (PS) and Hood Canal largely exploit local stocks. However, tagged fish from all regions are encountered in MSF's in the Strait of Juan de Fuca (JDF), throughout southern BC, and WA and OR coastal areas.

In 2007, there were 12 Chinook MSF's that occurred and they were largely restricted to PS and to the Columbia River with spring Chinook as the targeted group. Since then, Chinook MSF's have expanded substantially in marine and freshwater areas, with the number of Chinook MSF's more than doubling to 29 (Table 3-1). From 2010 to 2014, additional Chinook MSF's occurred and have been proposed in the marine waters of BC, PS, WA ocean areas, and freshwater areas in PS and Columbia River. Further, Chinook MSF's that target later run fish have been added. Prior to 2008, the indicator stocks encountered in MSF's were largely of PS origin or were Columbia River spring stocks. With the most recent additional fisheries proposed for Canadian waters, WA ocean areas, and Columbia River, a larger number of indicator stocks are likely to be encountered in MSF's (Table 3-5). In addition, MSF's have expanded substantially in PS, both geographically and temporally, with concomitant increases in catch in MSF's for Chinook Salmon.

In order to monitor the impacts of these expanding MSF's, Chinook DIT programs must be expanded to represent the new indicator stocks that will be encountered. Agencies, however, have been discontinuing rather than expanding their DIT programs. Agencies should reevaluate their DIT programs and consider expanding DIT groups, not discontinuing the programs.

Table 3–4. Number of tagged and marked Coho Salmon sampled (Obs) and percent of total estimated tags (expanded for the sample rate) in fisheries or in escapement, averaged over brood years 2003–2008. Some estimates are based on less than six years of data because some stocks were not tagged in all years. Coho Salmon escapements are not available in the Regional Mark Information System (RMIS) database for BC stocks; therefore, percentages shown for BC are only for fishery recoveries.

Region		Hatchery / Release Location	# Years Tagged	Mark-Selective Fisheries										Non-Selective Fisheries				Escapement		Total	
				BC		Puget Sound		WA Coast		Columbia R		OR Coast		Commercial		Sport					
				Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	Est
BC	Nass R - Skeena	Tobeagum Creek H	6	10	17%	-	-	-	-	-	-	-	-	152	67%	16	16%	-	-	177	672
	Coastal BC	Smooth Creek H	4	1	2%	-	-	-	-	-	-	-	-	84	61%	15	37%	-	-	99	367
		McLaughlin Bay SP	1	-	-	-	-	-	-	-	-	-	-	23	23%	6	77%	-	-	29	306
	Johnstone Strait	Quinsam River H	6	6	47%	-	-	1	1%	-	-	-	-	9	23%	2	28%	-	-	18	120
		Johnston Est Surpen	2	1	1%	-	-	-	-	-	-	-	-	29	25%	23	74%	-	-	52	220
	Georgia Strait	Big Qualicum River H	6	1	35%	1	8%	1	4%	-	-	-	-	4	31%	<1	22%	-	-	7	36
		Goldstream River H	6	3	54%	4	17%	4	13%	-	-	-	-	6	19%	1	15%	-	-	17	74
		Lang Creek H	2	24	50%	4	4%	3	2%	-	-	-	-	22	13%	11	30%	-	-	64	310
	SW Vancouver Isl	Robertson Creek H	6	44	83%	2	1%	7	3%	-	-	-	-	22	11%	1	1%	-	-	76	578
	Fraser R -	Inch Creek H	6	13	66%	4	8%	6	6%	-	-	1	1%	11	15%	1	4%	-	-	36	227
	Thompson R	Spius Creek H	6	4	26%	5	21%	11	24%	-	-	2	6%	9	22%	<1	1%	-	-	31	105
SOA	Strait of Juan de Fuca	Dungeness H	4	7	15%	2	2%	5	2%	-	-	-	-	53	32%	2	1%	192	47%	260	432
		Lower Elwha H	6	2	9%	2	3%	4	4%	-	-	-	-	11	25%	1	1%	94	56%	113	182
	Puget Sound North	Dennie Gobin H	6	4	5%	18	6%	22	4%	-	-	3	1%	230	71%	18	8%	38	4%	333	1106
		Glenwood Springs	1	-	-	-	-	-	-	-	-	-	-	2	100%	-	-	-	-	2	7
		Kendall Creek H	5	4	4%	5	2%	8	2%	-	-	-	-	171	72%	1	<1%	101	18%	289	735
		Lummi Sea Ponds	4	7	12%	4	2%	8	3%	-	-	2	1%	170	69%	3	6%	44	7%	237	613
		Skookum Creek H	6	6	4%	10	3%	17	3%	-	-	3	<1%	340	77%	2	<1%	183	13%	560	1,403
		Wallace R H	6	8	5%	13	3%	21	3%	-	-	4	1%	39	8%	13	4%	860	76%	959	1,661
		Marblemount H	6	8	5%	15	3%	23	3%	-	-	2	<1%	177	21%	39	6%	642	62%	906	1,793
	Puget Sound Mid	Elliott Bay TR SP	4	9	3%	31	4%	33	3%	-	-	3	<1%	597	79%	42	9%	53	2%	768	2,795
		Voights Creek H	6	9	8%	23	6%	17	3%	-	-	1	<1%	191	45%	26	11%	187	27%	454	1,288
		Keta Creek	3	13	4%	39	4%	36	3%	-	-	4	<1%	397	41%	62	9%	847	39%	1,399	3,292
		Soos Creek H	6	6	4%	16	3%	15	2%	-	-	3	<1%	171	38%	16	4%	524	48%	750	1,715
		Crowskull	3	5	4%	25	10%	14	3%	-	-	1	<1%	211	68%	35	13%	62	2%	353	1,114
		Crisp Creek Rearing	3	11	3%	40	4%	34	2%	-	-	4	<1%	413	41%	30	4%	1,690	47%	2,222	4,172

Table 3–4. (Continued) Number of tagged and marked Coho Salmon sampled (Obs) and percent of total estimated tags (expanded for the sample rate) in fisheries or in escapement, averaged over brood years 2003–2008.

Region		Hatchery / Release Location	# Years Tagged	Mark-Selective Fisheries										Non-Selective Fisheries				Escapement		Total	
				BC		Puget Sound		WA Coast		Columbia R		OR Coast		Commercial		Sport					
				Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	Est
WA	Puget Sound South	Minter Creek H	2	2	4%	3	4%	6	4%	-	-	1	<1%	30	28%	4	4%	186	55%	230	337
		Clear Creek H	1	2	16%	2	4%	5	5%	-	-	-	-	50	63%	2	2%	19	10%	80	188
		Kalama Creek H	6	1	3%	7	9%	3	2%	-	-	1	<1%	41	39%	5	7%	122	40%	178	311
		South Sound Net Pens	6	4	4%	10	5%	13	4%	-	-	1	<1%	211	79%	16	8%	2	<1%	257	864
	Hood Canal	George Adams H	6	4	3%	9	3%	13	3%	-	-	1	<1%	74	23%	9	4%	662	65%	771	1,206
		Quilcene Bay Sea Pen	6	10	5%	23	4%	21	2%	-	-	2	<1%	219	52%	14	5%	425	31%	713	1,901
		Quilcene NFH	6	6	4%	20	4%	17	3%	-	-	2	<1%	186	53%	7	4%	375	31%	613	1,501
		Port Gamble Bay Pens	6	4	6%	13	7%	11	4%	-	-	1	<1%	123	76%	7	6%	11	2%	169	650
	N. WA Coast	Makah NFH	6	3	3%	3	1%	22	6%	-	-	6	2%	26	3%	2	1%	309	84%	370	961
		Quinault NFH	6	8	2%	5	<1%	120	6%	-	-	27	2%	606	53%	1	<1%	479	37%	1,246	4,632
		Salmon R Fish Culture	6	2	1%	2	<1%	50	8%	-	-	12	2%	263	57%	1	<1%	204	31%	534	1,573
		Solduc H	6	9	3%	5	1%	124	10%	-	-	30	3%	61	6%	6	1%	1,206	76%	1,440	2,796
	Grays Harbor	Bingham Creek H	6	2	1%	1	<1%	41	5%	-	-	7	1%	51	7%	12	3%	939	83%	1,052	2,362
		Friends Landing NP	3	1	2%	1	<1%	49	17%	-	-	6	2%	102	51%	16	10%	129	18%	304	940
		Satsop Springs Ponds	5	<1	1%	1	1%	8	9%	-	-	3	2%	11	8%	2	1%	209	78%	234	402
		Humptulips H	1	3	2%	1	<1%	53	13%	-	-	11	3%	161	48%	4	2%	320	31%	553	1,086
		Skookumchuck H	3	1	1%	3	<1%	64	11%	-	-	9	1%	87	13%	15	5%	1,093	69%	1,271	1,869
	Willapa	Forks Creek H	6	3	2%	1	<1%	56	7%	1	<1%	21	3%	126	27%	6	2%	652	59%	865	1,879
		Naselle H	6	2	2%	1	<1%	46	12%	-	-	14	4%	131	73%	2	1%	84	9%	279	994
		Nemah H	4	3	2%	2	<1%	76	14%	-	-	28	7%	110	41%	1	1%	412	35%	632	1,278
CR	Mid and Upper	Oxbow H	4	-	-	-	-	8	3%	5	2%	6	3%	36	18%	1	<1%	445	73%	500	610
		Klickitat H	6	1	1%	1	1%	90	40%	8	4%	42	21%	61	26%	4	5%	2	<1%	208	510
		Cascade H	5	-	-	-	-	27	9%	14	5%	21	8%	198	65%	1	<1%	102	13%	362	819
		Washougal H	6	2	1%	2	1%	89	24%	10	5%	43	14%	64	19%	2	1%	286	35%	498	840
		Wells H	2	-	-	-	-	3	1%	1	<1%	-	-	103	95%	1	<1%	26	4%	133	622

Table 3–4. Number of tagged and marked Coho Salmon sampled (Obs) and percent of total estimated tags (expanded for the sample rate) in fisheries or in escapement, averaged over brood years 2003–2008.

Region		Hatchery / Release Location	# Years Tagged	Mark-Selective Fisheries										Non-Selective Fisheries				Escapement		Total	
				BC		Puget Sound		WA Coast		Columbia R		OR Coast		Commercial		Sport					
				Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	Est
CR	Lower CR	Big Creek H	6	-	-	-	-	18	6%	5	3%	15	7%	70	32%	1	1%	317	51%	424	632
		Bonneville H	5	-	-	-	-	47	7%	16	3%	46	8%	26	5%	2	<1%	1418	77%	1,555	1,856
		CEDC Youngs Bay Net	4	-	-	-	-	32	8%	11	4%	27	8%	293	80%	1	<1%	16	1%	379	1,118
		Cowlitz Salmon H	6	8	2%	4	<1%	374	28%	40	6%	163	15%	178	13%	19	2%	792	34%	1,578	2,893
		Deep River NP	6	-	-	-	-	16	6%	5	2%	15	6%	225	83%	-	-	20	2%	281	728
		Eagle Creek NFH	6	-	-	-	-	15	7%	6	4%	17	11%	22	27%	-	-	104	51%	165	481
		Elochoman H	5	<1	2%	-	-	23	14%	3	2%	18	14%	38	22%	1	1%	159	44%	243	369
		Faller Creek H	6	-	-	-	-	22	12%	7	8%	18	12%	11	10%	-	-	252	57%	310	431
		Grays River H	6	1	1%	1	<1%	34	18%	8	5%	31	18%	44	26%	1	<1%	180	31%	298	495
		Kalama Falls H	6	1	2%	1	<1%	40	13%	5	7%	23	9%	51	16%	1	1%	351	52%	472	694
		Klaskanine H	3	-	-	-	-	7	6%	2	2%	5	5%	42	56%	-	-	95	31%	151	312
		Klaskanine S FK Pond	3	-	-	-	-	28	9%	10	4%	21	7%	140	63%	1	<1%	141	16%	341	908
		Lewis River H	6	3	1%	6	<1%	261	12%	61	9%	148	8%	174	8%	4	<1%	2,507	62%	3,164	5,055
		North Toutle H	6	-	-	-	-	34	11%	15	11%	30	12%	14	6%	1	<1%	414	60%	508	810
		Sandy H	6	1	<1%	1	<1%	49	11%	16	5%	38	10%	75	16%	2	<1%	665	58%	845	1,174
OR	OR Coast North	Nehalem H	4	1	<1%	-	-	12	2%	-	-	20	5%	3	1%	1	<1%	1,023	91%	1,060	1,129
		Salmon River H	3	-	-	-	-	4	5%	-	-	5	11%	1	1%	1	3%	110	80%	121	139
		Trask River H	2	-	-	2	<1%	18	4%	-	-	65	14%	4	1%	1	<1%	1,102	81%	1,191	1,379
	OR Coast South	Butte Falls H	1	-	-	1	2%	8	13%	-	-	11	24%	5	21%	2	15%	23	24%	50	98
		Cole Rivers H	6	-	-	-	-	-	-	-	-	1	2%	-	-	1	1%	182	97%	185	187
		Rock Creek H	3	-	-	-	-	4	9%	-	-	32	76%	1	5%	2	7%	2	2%	42	113

Table 3-5. Number of tagged and marked Chinook Salmon sampled (Obs) and percent of total estimated CWTs (% of Est) in fisheries or in escapement averaged over brood years 2001 - 2006.

Region	Stock	Mark-Selective Fisheries										Non-Selective Fisheries				Escapement		Total	
		PS		WACST		COLR		TERM		Total		Commercial		Sport					
		Obs	%Est	Obs	%Est	Obs	%Est	Obs	%Est	Obs	%Est	Obs	%Est	Obs	%Est	Obs	%Est	Obs	Est
British Columbia	Atnarko Summer	-	-	-	-	-	-	-	-	-	-	1	1%	1	0%	14	99%	16	1,1
	Big Qualicum	1	2%	-	-	-	-	-	-	-	2%	1	1%	3	1%	44	96%	49	1,0
	Chehalis (Harrison Fall Stock)	1	2%	1	2%	-	-	-	-	2	2%	58	4%	3	1%	1	93%	64	7,1
	Chilliwack (Harrison Fall Stock)	5	2%	1	2%	-	-	-	-	11	2%	119	3%	4	1%	3	93%	137	1,1
	Cowichan Fall	1	2%	<1	<1%	-	-	-	-	1	2%	1	0%	1	0%	28	97%	31	2,1
	Deena Creek Spring	-	-	-	-	-	-	-	-	-	-	-	1%	-	0%	1	99%	1	1,1
	Klaskish/Kakweiken Summer	-	-	-	-	-	-	-	-	-	-	93	94%	48	5%	1	1%	142	8,1
	Nanaimo River Fall	-	-	-	-	-	-	-	-	-	-	4	1%	1	0%	6	98%	11	1,1
	Nicola River Spring	<1	<1%	1	<1%	-	-	-	-	1	2%	64	2%	31	1%	1	97%	97	4,1
	Pantledge Summer	-	-	-	-	-	-	-	-	-	-	1	0%	1	0%	28	99%	30	1,1
	Quinsam Fall	-	-	-	-	-	-	-	-	-	-	1	0%	3	1%	49	99%	53	1,1
	Robertson Creek	-	-	-	-	-	-	-	-	-	-	268	46%	4	1%	44	53%	316	1,1
	Lower Shuswap River Summers	-	-	<1	<1%	-	-	-	-	<1	<1%	64	1%	3	0%	1	99%	68	8,1
WA Puget Sound	George Adams Fall Fingerling	20	7%	4	2%	-	-	4	2%	28	12%	44	1%	1	0%	1	87%	74	1,1
	Green River Fall Fingerling	13	3%	3	2%	-	-	-	-	16	5%	268	1%	1	0%	1	94%	286	1,1
	Grovers Creek Fall Fingerling	30	9%	10	2%	-	-	-	-	40	12%	118	3%	40	1%	1,144	83%	1,342	1,1
	Nisqually Fall Fingerling	28	6%	1	2%	-	-	-	2%	31	9%	111	1%	3	0%	1,080	90%	1,225	1,1
	Nooksack Spring Fingerling	4	2%	1	2%	-	-	-	0%	5	4%	43	10%	3	1%	1	85%	52	1,1
	Samish Fall Fingerling	13	4%	4	2%	-	-	-	-	17	6%	120	44%	3	1%	1	49%	47	1,1
	Skagit Spring Fingerling	9	2%	1	2%	-	-	101	13%	111	26%	34	1%	40	1%	1,748	72%	1,933	1,1
	Skagit Spring Yearling	9	2%	1	2%	-	-	94	12%	105	40%	34	1%	3	1%	1	58%	143	1,1
	Skykomish Fall Fingerling	5	4%	1	2%	-	-	-	-	6	5%	34	1%	1	0%	1	94%	41	1,1
	South Puget Sound Fall Yearling	9	13%	1	2%	-	-	-	-	10	15%	34	1%	1	0%	1	84%	46	1,1
	Skagit Summer Fingerling	1	2%	1	2%	-	-	-	-	2	2%	145	46%	1	0%	84	52%	232	1,1
	Stillaguamish Fall Fingerling	9	9%	1	2%	-	-	-	-	10	11%	11	3%	3	1%	1	85%	26	1,1
	White River Spring Fingerling	4	12%	<1	2%	-	-	-	-	4	14%	1	1%	-	0%	14	86%	19	1,1

Table 1-1 (Continued) Number of tagged and marked Chinook Salmon sampled (Obs.) and percent of total estimated (Est.) (% of Est.) in fisheries or to escapement averaged over years 2006–2010.

Region	Stock	Mark-Selective Fisheries										Non-Selective Fisheries						Escapement		Total	
		WA		B.C.		CNLB		NSRB		Total		Commercial		Sport							
		Obs.	% of Est.	Obs.	% of Est.	Obs.	% of Est.	Obs.	% of Est.	Obs.	% of Est.	Obs.	% of Est.	Obs.	% of Est.	Obs.	% of Est.	Obs.	% of Est.	Obs.	% of Est.
Ocean	Ocean Fall Tagging																				
	Ocean Fall Tagging																				
	Ocean Fall Tagging																				
Columbia R	Lewis Fall Tag																				
	Portland Tag																				
	Columbia Lower R. R.																				
	Lewis River Tag																				
	Lyons Ferry																				
	Lyons Ferry Yearling																				
	Spring Creek Tag																				
	Columbia Summer																				
	Upriver Bright																				
	Willamette Spring																				
OR Coast	Elk River																				
	Salmon River																				

[illegible]

[illegible]

6.1 Submission of Work Subsidies History Proposals

[illegible]

6.2 Status of Work Subsidies History Reports

[illegible]

[illegible]

- [illegible]
- [illegible]
- [illegible]

[illegible] [illegible] [illegible] [

6.4 Ethernet, IEEE, and Networking Protocols

[illegible]

6.5 Wireless Regulations & IEEE

[illegible]

estimated from harvest cards. These mixed bag regulations present a problem in estimating mortalities of unmarked DIT groups and associated wild stocks. The agencies proposing these mixed regulations should assist in developing the analytical tools to measure the impacts of these fisheries or provide documentation if methods have been developed and employed.

Table 4-1. Types of MSF regulations proposed for MSF's

Regulations Complexity	Description	Example	Location & Fishery
Simple MSF	Only marked fish can be retained	Retain up to 2 fish per day, any size, marked only Bag limit of 6, of which only 2 may be adults, all fish must be marked	WA Areas 1-4 & 5-13 Coho and Chinook fisheries WA Columbia River Chinook sport fisheries
Mark-mixed bag limit	A portion of total bag limit can be unmarked. This can be a daily limit bag or a seasonal bag limit	Retain up to 4 fish per day, of which no more than 2 may be wild Seasonal limit on unmarked fish may range from 1-10 unmarked Chinook depending on the river system. The catch of marked Chinook has no seasonal limit.	Skagit River Coho and Chinook sport fisheries Oregon coastal Coho and Chinook fisheries
Mark and size-mixed bag limit	Size-range-specific allowances for retention of unmarked fish	2 fish per day, retain all between 45-67 cm, only marked fish over 67 cm *OR Coast:* Some areas are partially MSF, where an angler may retain 1unmarked Chinook Salmon as part of the 2 fish daily bag limit. Adjacent areas may be non-selective or entirely mark selective. *OR Coast all rivers:* variable because of a seasonal limit of 10 unmarked Chinook. These regulations do not apply to Chinook jacks (15"-24")	BC Strait of Juan de Fuca Snake River fall Chinook, and Oregon coastal fisheries

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6 APPENDICES

Appendix A. Understanding of the Pacific Salmon Commission Concerning Mass Marking and Selective Fisheries (Revised February 2004).

Understanding of the
Pacific Salmon Commission
Concerning
Mass Marking and Mark Selective Fisheries

February 2004 Policy Statement

The Pacific Salmon Treaty's Memorandum of Understanding (MOU) obliges the Parties to, among other things, "maintain a coded-wire-tag and recapture program designed to provide statistically reliable data for stock assessment and fishery evaluation." The Pacific Salmon Commission (PSC) recognizes that the selective fisheries for marked hatchery Coho and Chinook salmon can impact the coastwide coded-wire-tag (CWT) program. For the sole purpose of fulfilling this MOU obligation, the PSC has established the following policies and procedures. This policy does not preclude the PSC from evaluating the impacts of, and making recommendations concerning, mass marking or selective fishery plans as they affect the negotiation and establishment of Treaty annex provisions.

It shall be the policy of the PSC to review proposals for mass marking and selective fisheries to determine consistency with the Parties' commitment to the MOU provisions regarding the reliability of data needed for management of salmon fisheries within the jurisdiction and management area of the Treaty, including whether they impose substantial cost increases for agencies to conduct required data collecting programs.

The PSC shall establish a Selective Fishery Evaluation Committee (SFEC) to perform the activities set forth in the attached Terms of Reference.

To facilitate the SFEC review, the Parties shall do their utmost to ensure that their domestic managers submit all proposals for mass marking (MM) and mark-selective fisheries (MSF) which could potentially affect stocks or fisheries of concern to the PSC in accordance with the following schedule:

1. Not later than June 1 of each year. Provide early notice containing the agency's plans to consider conducting MSFs over the next 3-5 years.
2. Not later than June 1 of the year prior to implementation. Provide new or substantially changed MM or MSF project proposals.
3. Not later than November 1 of the year prior to implementation. Provide proposals for MM or MSF programs that are anticipated to continue annually without substantive change.
4. Upon completion of domestic fishery planning processes, agencies conducting MSFs are to provide final selective fishery plans.

5. Upon completion of MM programs, agencies are to report the number of fish that were actually mass marked and the extent to which releases are (single and double index) tagged for assessment.
6. Agencies shall report results of MSFs conducted during a season in the annual post-season report provided, using a format specified by the SFEC.
7. Not later than November 30 of the year following conduct of MSFs. Agencies are to report fishery and stock-age-specific estimates of mortalities for unmarked fish impacted by MSFs to the PSC technical committees

- The PSC shall consider, by the annual February PSC meeting, the SFEC reviews of proposals for MM and MSFs and discuss potential actions to address concerns related to any MM or MSF proposals that the SFEC determines will significantly and adversely affect the CWT program.
- The Parties will do their utmost to ensure that MM and MSF proposals are developed in consultation with domestic co-management agencies or processes, and that proposing agencies or entities provide information required by the SFEC and adhere to reporting requirements to enable the PSC technical committees to complete their assignments in a timely manner.
- After the occurrence of a selective fishery and when the data are available, the PSC shall review the management agency report on the actual conduct of the fishery with respect to its impact on the CWT program, and recommend changes and improvements.

Terms of Reference for the Selective Fishery Evaluation Committee

I. Reporting and Committee Structure: The Selective Fishery Evaluation Committee (SFEC) will report to the PSC and will be comprised of a Steering Committee and two working groups: the Regional Coordination Working Group (RCWG) and the Analytical Working Group (SFAWG). All official members of the Steering Committee and working groups will be considered members of the SFEC.

A. Steering Committee: The Steering Committee will be comprised of:
   1. the co-chairs of the PSC Coho Technical Committee, Chinook Technical Committee, and Data Sharing Technical Committee;
   2. the co-chairs of the two working groups;
   3. agency mass-marking/selective-fishery coordinators; and
   4. additional agency representatives approved by the responsible Party.

B. Regional Coordination Working Group (RCWG): The RCWG may be comprised of members of the Steering Committee and other PSC technical committees and of the agency representatives approved by the responsible Party. All RCWG members should contribute actively to the work of this group.

C. Selective Fishery Analysis Working Group (SFAWG): The SFAWG may be comprised of members of the Steering Committee and other PSC technical committees and of the agency representatives approved by the responsible Party. All SFAWG members should contribute actively to the work of this group.

II. Duties of the SFEC

A. Serve as a coastwide clearinghouse to facilitate the appropriate level of coordination and reporting on MM and MSF programs among the Parties, affected agencies, and existing coastwide and regional committees established to monitor activities related to the coastwide CWT program;

B. Provide advice to the PSC regarding potential adverse impacts of MM and MSFs on the CWT program;

C. Assess and monitor the cumulative impacts of MSFs on stocks of concern to the PSC;

D. Provide MM or MSF project proponents with information regarding concerns for potential impacts of their projects on the CWT program.

E. Receive and review MM and MSF proposals from the proponent(s) as early in the planning process as possible to identify potential issues and concerns regarding impacts on the CWT program.

F. Establish a technical evaluation process that will:

1. Review proposed mass-marking/selective-fisheries initiatives developed by the proponent(s) and identify potential impacts on other jurisdictions and the CWT program;
2. Review, in consultation with relevant PSC technical committees, procedures and protocols for marking, sampling, and evaluation developed by the proponent(s) and, if appropriate, develop and recommend alternative procedures to address potential concerns or measures that could be taken to mitigate for adverse impacts on the CWT program;
3. Establish standard formats and reporting requirements for agencies conducting MSFs to use when providing post-season information. Review post-season agency evaluations of the performance of MSFs and their estimates of mortalities on stocks of concern to the PSC;
4. Identify information needs or request modifications of proposals to meet concerns regarding impacts on the CWT program; and
5. Conduct, at agreed intervals, technical evaluations of mass marking and selective fishery programs in order to assist the Parties to maintain the integrity of the CWT program.

G. Work with PSC Technical Committees to establish formal standards and objectives for a viable CWT program to enable more precise evaluation of potential impacts of MM and MSFs on the viability of the coastwide CWT program and to guide the development of mitigation measures.

H. Specific duties of the Steering Committee include being responsible for overall coordination and prioritization of the activities for the working groups and being the focal point for reporting to the PSC. The agency mass-marking/selective-fishery coordinators should ensure that mass marking and selective fishery proposals are provided to the SFEC in a timely manner.

III. Specific duties of the RCWG, among other related activities, include:

A. Coordinate and report on continuing research on electronic detection and mass marking technologies;
B. Collate and share information on CWT sampling procedures and programs; suggest modifications to sampling and monitoring programs to proponents;
C. Review MM proposals to determine potential impacts on sampling and tagging programs;
D. Provide agencies with a list of MM and MSF proposals received by the SFEC;
E. Provide the necessary liaison with the Data Standards Working Group of the Data Sharing Technical Committee to ensure that necessary modifications are made to PSC data exchange formats to maintain the integrity of the CWT system; and
F. Prepare an annual report summarizing mass marking statistics, index tag groups, and sampling programs for marks and CWTs.

IV. Specific duties of the SFAWG, among other related activities, include:

A. Design marking and sampling strategies that will achieve desired precision for CWT-based estimates;
B. Develop analytical tools for the evaluation, by the SFEC and MSF proponents, of MM programs and MSFs and their potential impacts on the coastwide CWT program;
C. Provide the necessary technical liaison with agencies and other coastwide committees working on selective fishery evaluation models;
D. Review and recommend parameter values for assessing impacts of MSFs;
E. Develop analytical tools for estimating the impacts of MSFs on escapements and exploitation rates for naturally spawning Coho and Chinook stocks based on post-season information;
F. Review MSF proposals and provide advice to the proponents regarding the design of MSFs and the conduct of sampling and monitoring programs; and
G. Recommend guidelines, procedures, and/or time frames necessary to evaluate the success of MSFs in conserving naturally spawning stocks.

L. Cassidy J. Davis
Chair Chair

Appendix B. Mass Marking Proposal Template.

2014 Template for Mass Marking Proposals

Mass Marking Proposal ID #
Date Received

PROPOSAL TITLE:

This template is intended for proposals to mark any release group from a hatchery complex or area that meets all of the following conditions:

1) Chinook or Coho Salmon;
2) 100,000 or more fish in release group
3) fish are marked with an adipose clip, but untagged; and
4) expected to be intercepted in Pacific Salmon Commission fisheries.

CONTACT INFORMATION

Proposing Agency	
Contact Person	
Mailing Address	
Phone Number	
Fax	
Email	

IS THE PROPOSAL:

New	
substantially changed	
or a continuation of a previous proposal	

PROPOSED MARKING AND TAGGING

1. **Purpose of Mass Marking**
   a. Provide a brief description of the goals and objectives of the proposal (e.g., to obtain information on hatchery straying to wild spawning grounds, to increase fishing opportunities, or to identify hatchery/wild compositions in fisheries).

   b. If this is not a new proposal, list the Mass Marking Proposal ID number(s) (assigned by the PSC Executive Secretary) corresponding to the previous proposal. In addition, **describe any significant differences from previous proposals** (i.e., additions or deletions of mass marked stocks or DIT groups).

   c. Identify potential mark-selective fisheries that your agency may pursue in the future that will target these proposed mass marked stocks.

2. **Proposed 2014 Marking and Tagging Levels**

   List all proposed mass marking and DIT plans (see example format below), including the following fields: area/region, hatchery, stock, number of fish to be tagged with and without fin clip, number of fish to be untagged with and without fin clip, and prior marking status.

   Example format for proposed mass marking and tagging plans. Identify all DIT groups with an asterisk (*).

   Species:
   Brood Year:
   Release Year:

Area or Region	Hatchery	Stock	Number to be Tagged (CWTs)		Number to be Untagged		Marked Last Brood Year? (Y/N)
			Ad+CWT	CWT Only	Ad Only	No Clip	
Total for Region							

3. **Concerns Regarding the Proposal**

   a. **List any known reviews of the mass marking proposal** that have been conducted (e.g., by the Mark Committee) and the outcome of those reviews. List any marking programs/agreements that this proposal may conflict with and briefly describe the possible conflict.

   b. **List any issues of concern previously identified** by the SFEC, PSMFC Mark Committee, or fishery management forums related to this mass marking proposal, and describe how those concerns have been addressed.

(new this year)

4. **Information to Support Estimation of Projected Encounters**

   In order to standardize methods used to estimate projected future encounters of mass-marked fish in sampling programs, SFEC requests the following information:

   - Identify representative CWT groups (e.g., key or indicator stocks from each region) for each mass-marked stock for the following three brood years:

     Coho = BYs 2006–2008, Chinook = BYs 2004–2006.

Example format for providing representative CWT groups:

Mass-Marked Stock	Brood Year	Tag Code(s)	Comments

Appendix C. Mark-Selective Fishery Proposal Template.

2014 TEMPLATE FOR MARK-SELECTIVE FISHERY PROPOSALS (PCSRF Version)

Mark Selective Fishery Proposal ID #
Date Received

MARK-SELECTIVE FISHERY PROPOSALS - TITLE

Contact information

Proposing Agency	
Contact Person	
Mailing Address	
Phone Number	
Fax	
Email	

Is the proposal

new or not yet reviewed by PSC-SFEC ☐
substantially changed ☐

Purpose/management objective

Describe the management objective of the proposed mark-selective fishery.

Location and time of the proposed mark-selective fishery

Please include any information when there are breaks or changes in regulations that might impact sampling stratification (see Question 7b below)

1. Location of the fishery:
2. Year and month(s) when the fishery is proposed to occur:

Other information about the fishery:

3. Target species/stocks (including nontarget PSC species/stocks of concern):
4. Gear to be used:
5. Other regulation details (e.g., size restrictions, bag limits, mixed bag information):

Projected impacts BY the fishery

4. Identify all known wild CWT stocks likely to be encountered in this fishery (including individual tag codes if available), whether these stocks were Healthy Index Tagged (HIT). Appendices F and G provide tables of tagged indicator stocks for coho and Chinook for your convenience. Please note we are interested in tagged impacts alone; untagged hatchery production should not be included.

In-season management

1. Describe your sampling program for sampling for CWTs, marks and estimation of total catch. Attach your sampling plan if available. At a minimum, include descriptions for the following:
    a. CWT recoveries.
        i. Will there be *random* sampling of CWTs (i.e., fishery visiting fisheries contracted for biological sampling of harvest) or will you be using voluntary programs?
        ii. If random will there be ETD or visual identification of tagged fish?
        iii. If ETD is *random* sample, will all tagged fish (counted and uncounted) be processed?
        iv. If random what is the expected sample rate for CWTs?
        v. If voluntary programs are used, how is the awareness factor estimated?
    b. Monitoring for retained catch by sample strata for sample expansion. The sample strata and the strata of catch estimation post-season (i.e., whenever there is a change in regulation such as from MSF to non-selective, or change in bag limits, the sampling strata should also change).
    c. Monitoring of mark rate in the MSF (the total mark rate, percent marked in the harvest from the fishery).
    d. Other information, e.g., retained unmarked fish (mixed bag fisheries, or mark recognition error in MSF).

Other information.

1. Please include any other information that will be useful for estimation of unmarked tagged mortalities in your MSF. For instance, sources of estimates of unmarked to marked ratios for SHT tagged groups (e.g., in a net fishery, nearby hatchery, non-selective fishery). Please provide any input you with on methods to estimate the unmarked tagged mortalities for SHT groups, or the appropriate release mortality rates to be used.

Appendix B. Mark-Selective Fishery Proposal Spreadsheet Template

Template 4 for MSF Proposals — Year: 2014

Fishery information							Other regulations			Data	GMT details		Sampling program							Other
Species	Fishery characteristics	Fishery type (e.g. Freshwater, Ocean)	Area	Season (if fishery)	Fishery type and name (e.g. Ocean, Recr, Troll, Area 2)	Species (Target and Mark combination)	Bag limits (adult and jacks/day or round fish/day)	Size limits	Other regulations (gear restrictions, release mortality, etc. e.g., Only, plus barbless, bonking, etc.)	Harvest and release mortality	Is GMT sampling required? (Yes/No)	Sampling rate	Sampling rate	Sampling rate	Sampling rate	Sampling rate	Other sampling protocol (encoding, etc. comments)	Other (Indicate if you are the designated lead for this proposal)

Appendix C — Status of Water Permitting Proposals Reconstructed, 2011 (by Water Permitting Area and Type of Proposal)

Description of Proposed Land Agency	Year of Commencement Proposed	WPC Proposed Position
Lake Ashburn		
Southern Rd — Lot — 1 Unit	Commenced	$[illegible]
Royal Crescent Lots — Modified Group	Commenced	$[illegible]
Rockingham Court Lots — Modified Group	Commenced	$[illegible]
Rockingham Crescent Lots — Modified	Commenced	$[illegible]
Crescent Rd — Lot — 1 Unit	Commenced	$[illegible]
Royal Crescent Rd — Lot — 1 Unit	Commenced	$[illegible]
Crescent Rd — Lot — Unit	Commenced	$[illegible]
Regent Court — Lot — Unit	Commenced	$[illegible]
Pinnacle Valley		
Pinnacle Court Lots — Group	Commenced	$[illegible]
Crescent Rd — Lot — Pinnacle	Commenced	$[illegible]
Rd — Lot — Pinnacle	Commenced	$[illegible]
Rockingham Rd — Spring — Pinnacle	Commenced	$[illegible]
Old Church Court Spring — Pinnacle	Commenced	$[illegible]
Old Church Court Spring — Pinnacle	Commenced	$[illegible]
Crescent Rd — Lot — Pinnacle	Commenced	$[illegible]
Old — Lot — Unit — Pinnacle	Commenced	$[illegible]
Rockingham Rd — Spring — Pinnacle	Commenced	$[illegible]
Pinnacle Rd — Lot — Unit — Pinnacle	Commenced	$[illegible]
Pinnacle Rd — Spring — Pinnacle	Commenced	$[illegible]
Royal Crescent — Pinnacle	Commenced	$[illegible]
Crescent Rd — Pinnacle	Commenced	$[illegible]
Rockingham Crescent — Pinnacle	Commenced	$[illegible]
Pinnacle Rd — Lot — Pinnacle	Commenced	$[illegible]

[illegible] [illegible] [illegible] [

Appendix C — Bidder — [Contract / Lot / Proposal] Pricing Schedule (ex-Works)

Submitted by: [Bidder name]

Item No.	Description / Scope of Work	Unit	Quantity	Unit Price (in figures)	Total Price (in figures)
	Section A — [Section Title]				
A.1	[Item description]	[unit]	[qty]	[unit price]	[total price]
A.2	[Item description]	[unit]	[qty]	[unit price]	[total price]
A.3	[Item description]	[unit]	[qty]	[unit price]	[total price]
A.4	[Item description]	[unit]	[qty]	[unit price]	[total price]
A.5	[Item description]	[unit]	[qty]	[unit price]	[total price]
A.6	[Item description]	[unit]	[qty]	[unit price]	[total price]
	Section B — [Section Title]				
B.1	[Item description]	[unit]	[qty]	[unit price]	[total price]
B.2	[Item description]	[unit]	[qty]	[unit price]	[total price]
B.3	[Item description]	[unit]	[qty]	[unit price]	[total price]
B.4	[Item description]	[unit]	[qty]	[unit price]	[total price]
B.5	[Item description]	[unit]	[qty]	[unit price]	[total price]
	Section C — [Section Title]				
C.1	[Item description]	[unit]	[qty]	[unit price]	[total price]
C.2	[Item description]	[unit]	[qty]	[unit price]	[total price]
C.3	[Item description]	[unit]	[qty]	[unit price]	[total price]
C.4	[Item description]	[unit]	[qty]	[unit price]	[total price]
C.5	[Item description]	[unit]	[qty]	[unit price]	[total price]
C.6	[Item description]	[unit]	[qty]	[unit price]	[total price]
C.7	[Item description]	[unit]	[qty]	[unit price]	[total price]
C.8	[Item description]	[unit]	[qty]	[unit price]	[total price]
C.9	[Item description]	[unit]	[qty]	[unit price]	[total price]
C.10	[Item description]	[unit]	[qty]	[unit price]	[total price]
C.11	[Item description]	[unit]	[qty]	[unit price]	[total price]
C.12	[Item description]	[unit]	[qty]	[unit price]	[total price]

1. [Note: Confirm that the prices are ex-Works, [Destination], and that they include all packing, marking, and export clearance.]
2. [Quantities are estimated and may be increased or decreased by up to [25]% at the unit prices quoted, in accordance with the Contract.]
3. [All prices shall be quoted in [currency] and shall remain fixed for the duration of the Contract.]
4. [The Bidder shall not alter the format of this Schedule. Any deviation may result in the Bid being rejected.]
5. [Unit abbreviations: [pc] = piece, [set] = set, [kg] = kilogram, [m] = metre, [lot] = lump sum.]

[illegible]	[illegible]	[illegible]	[illegible]
Open: Woodcock Drive Ian-Iker Cider	WDF-WDFW-08	2018	2007–2018
Open: W-S Cross Iron Ian-Iker Jill Cinnock	WDF-WDFW-09	2018	2010–2018
Open: Skidmore Drive Ian-Iker Cinnock	WDF-WDFW-20	2018	2010–2018
Open: Willaga Bay Alternative Cider	WDF-WDFW-22	2018	2007–2018
Open: Grays Harbor Stamp Iron 1.5 Cider	WDF-WDFW-23	2018	2010–2018
Open: Grays Harbor Alternative Cider	WDF-WDFW-24	2018	2007–2018
Commercial: Willaga Bay Cinnock	WDF-WDFW-27	2018	2010–2018
Open: Willaga Bay Stamp Iron 1.1 Cinnock	WDF-WDFW-28	2018	2010–2018
Open: Willaga Bay Alternative Cinnock	WDF-WDFW-29	2018	2010–2018
Open: Snake River spring Cinnock	WDF-WDFW-30	2018	2010–2018
Open: Willaga Bay Stamp Iron 1.1 Cider	WDF-WDFW-31	2018	2010–2018
Commercial: Grays Harbor Stamp Iron 3C Cider	WDF-WDFW-34	2018	2009–2018
Open: Quilleyute River Cider	WDF-WDFW-35	2018	2007–2018
Open: Quilleyute River system Ian-Iker spritzen Cinnock	WDF-WDFW-36	2018	2007–2018
Open: Hoh River Ian-Iker spring Cinnock	WDF-WDFW-37	2018	2009–2018
Open: summer W-S strain 5.01 on Ian-Iker Cinnock[1]	WDF-WDFW-39	2018	2007–2018
Open: winter W-S strain 5.03 on Ian-Iker Cinnock[1]	WDF-WDFW-40	2018	2007–2018[2]
Open: Sashimamit-8 on Ian-Iker Cinnock	WDF-WDFW-47	2018	2018
Commercial: Grays Harbor strain 3.6, 3B, 3C, 3D Cinnock	WDF-WDFW-48	2018	2018
Open: Lower Grand Ronde spring Cinnock	WDF-WDFW-49	2018	2018
Open: Skagit-8 Ian-Iker Cider	WDF-WDFW-50	2018	None
Open: Summit-8 Ian-Iker Cider	WDF-WDFW-51	2018	None
[illegible]			
Open: Lower Columbia-8 on Ian-Iker spring Cinnock	WDF-CEDFW-WDFW-01	2018	2007–2018
Open: Columbia-8 on Ian-Iker Columbia-sun Cinnock	WDF-CEDFW-WDFW-02	2018	2007–2018
Commercial: Lower Columbia-8 on Ian-Iker spring Cinnock (Hops and maple ale)	WDF-CEDFW-WDFW-03	2018	2007–2018
Open: Lower Columbia-8 on Ian-Iker Cider (since 1995)	WDF-CEDFW-WDFW-04	2018	2007–2018
Open: Columbia-8 on Ian-Iker Jill Cinnock	WDF-CEDFW-WDFW-05	2018	2015–2018

[1] Proposals WDF-WDFW-02 (Areas 7 and 6) and WDF-WDFW-03 (Areas 5, 10, 11 and 13) were both incorporated into WDF-WDFW-39 in 2015. The proposal covers all summer spot WDA in the Puget Sound (Areas 5–13).

[2] Actual implementation of summer WDA in Cinnock in Puget Sound was step-wise over time, with areas added over the years as follows: Areas 7 and 6 summer spot WDA began in 2015 (proposal 15- WDF-WDFW-02); Areas 5, 10, 11, and 13 began in summer 2017 (proposal 15- WDF-WDFW-03). Each of these WDA has continued each summer thereafter.

[3] Proposal WDF-WDFW-36 in 2015 covers all spot WDA areas of Puget Sound (Areas 5–13) during the winter time period (October–April), whereas in previous years (2003–2015) of WDFW's operation winter spot WDA proposal for Puget Sound (proposal 13-number WDF-WDFW-06), these seasons were not included – i.e., limited to areas 6, 7, 8.1, 8.2, 9 & 10.

[4] Actual implementation of winter WDA in Cinnock in Puget Sound was step-wise over time, with areas added over the years as follows: Areas 8.1 and 8.2 winter spot WDA began in October 2003–April 2004 (proposal 13- WDF-WDFW-06); Area 10 began in December 2007–January 2008; Area 7 began in February 2008; and Area 9 began in January 31–April 17, 2008. Each of these WDA has continued each winter thereafter.

Fishery, Location, Target Stock by Agency[1]	Proposal ID[2]	Most Recent Proposal[3]	Years with MSF since 2003[4]
Commercial, Lower Columbia River (from Buoy 10 upstream to Beacon Rock), on hatchery Coho[5]	MSF-CBDFW/WDFW-406	2016	2015
Commercial, Lower Columbia River (from Buoy 10 upstream to Beacon Rock), on hatchery Chinook (Coho, secondarily)[5]	MSF-CBDFW/WDFW-407	2016	2015
Alaska Department of Fish and Game			
Sport, Snake River, on fall Chinook	MSF-ODFG-404	2016	2009–2015

[1] Proposal MSF-CBDFW/WDFW-06 was originally submitted as MSF-CBDFW-07 in 2015 but the proposal ID was changed to continue the joint proposal numbering sequence.

[2] Proposal MSF-CBDFW/WDFW-07 was originally submitted as MSF-CBDFW-08 in 2015 but the proposal ID was changed to continue the joint proposal numbering sequence.

Appendix G. Current PSC Coho CWT Exploitation Rate Indicator Stocks and DIT Groups.

Region	Stock Representation	Indicator Stocks	DIT
BC North Coast	North Coast Wild	Zolzap	
	Skeena	Toboggan	
Interior Fraser	Thompson River	Coldwater (Spius Hatchery) Eagle River	
Georgia Basin	East Coast Vancouver Island	Big Qualicum Goldstream River	
	Lower Fraser	Inch Creek	√
	North Vancouver Island	Quinsam River	√
	North Vancouver Island Wild	Keogh	
West Coast Van Is.	West Coast Vancouver Island	Robertson Creek	
Puget Sound	Nooksack	Skookum Creek H. Lummi Bay Ponds	
	Skagit	Skagit (Marblemount H.) Baker River Wild	√
	Stillaguamish/Snohomish	Skykomish (Wallace River) Tulalip Bay (Bernie Gobin)	√
	Mid Puget Sound	Green River (Soos Creek H.)	√
	South Puget Sound	Puyallup (Voights Creek H.) Peale Pass (Squaxin Net Pens) Nisqually (Kalama Creek H.)	√
	Hood Canal Wild	Big Beef Creek	
	North Hood Canal	Quilcene NFH Quilcene Net Pens Port Gamble Net Pens	√
	South Hood Canal	George Adams H.	√
	Dungeness	Dungeness H.	
	Strait of Juan de Fuca	Lower Elwha H.	√
Washington Coast	North Coast	Makah NFH Solduc (fall run)	(dropped) √
	North Central Coast	Quillayute Wild Quillayute (Salmon R. Fish Culture)	√
	Quinault	Quinault NFH	√
	Grays Harbor	Chehalis R. Wild Satsop Springs Ponds Satsop (Bingham Cr. H. late) Satsop (Bingham Cr. H., early)	√
	Willapa Bay	Forks Creek H. (late fall run) Forks Creek H. Nemah R. H. Naselle H.	√
Columbia Basin	Lower Columbia River	Lewis River (Type N and S) Eagle Creek Sandy River Tanner Cr.	√ √ √ new in 2012
Oregon Coast	Oregon South Coast	Rogue River (Cole Rivers)	

Appendix H. Current PSC Chinook CWT Exploitation Rate Indicator Stocks and DIT Groups.

Area	Natural/Unmarked Stock Representation	Exploitation Rate Indicator Stocks	Run Type	DIT
S.E. Alaska	Southeast Alaska	Alaska Spring	Spring	
British Columbia	North/Central BC	Kitsumkalum	Summer	
	West Coast Vancouver Is	Robertson Creek	Fall	
	Georgia Strait	Puntledge	Summer	
		Quinsam	Fall	
		Big Qualicum	Fall	
		Cowichan	Fall	
	Lower Fraser River	Chehalis (Harrison Stock)[1]	Fall	
		Chilliwack (Harrison Stock)	Fall	(dropped)
Puget Sound	North Puget Sound	Nooksack Spring Fingerling	Spring	(dropped)
		Samish Fall Fingerling	Fall	√
	Central Puget Sound	Skagit Spring Yearling	Spring	√
		Skagit Spring Fingerling	Spring	
		Skagit Summer Fingerling	Summer	
		Skykomish Summer Fingerlings[2]	Fall	√
		Stillaguamish Summer/Fall Fingerling	Fall	
	Hood Canal	George Adams Fall Fingerling	Fall	√
	South Puget Sound	White River Spring Yearling[3]	Spring	
		Green River Fall Fingerling	Fall	√
		Grover Creek Fall Fingerling	Fall	√
		Nisqually Fall Fingerling	Fall	√
		South Puget Sound Fall Yearling	Fall	
	Strait of Juan de Fuca	Hoko Fall Fingerling	Fall	
Washington Coast	North Wash. Coast	Sooes Fall Fingerling	Fall	
		Quoets Fall Fingerling	Fall	
		Quinault Lake Fall Fingerling[2]	Fall	√
	Willapa Bay	Forks Creek Fall Fingerlings[2]	Fall	√
Columbia Basin	Columbia R. (WA)	Cowlitz Tule	Fall Tule	(dropped)
		Spring Creek Tule	Fall Tule	√
		Little White Salmon[2]	Fall Bright	√
		Columbia Summers	Summer	
	Columbia River (OR)	Columbia Lower River Hatchery	Fall Tule	√
	Upper Columbia R.	Columbia Upriver Bright	Fall Bright	
		Hanford Wild	Fall Bright	
		Priest Rapids	Fall Bright	√ new
	Lower Columbia R.	Lewis River Wild	Fall Bright	
		Willamette Spring	Spring	(dropped)
		Lewis River Spring[2]	Spring	√
	Snake River	Lyons Ferry	Fall Bright	
Oregon Coast	North Oregon Coast	Salmon River	Fall	

[1] These stocks are CWT-tagged, but there is no quantitative CWT escapement data, useful for distribution only.
[2] DIT group not currently an indicator stock.
[3] No longer adipose-fin clipped.

Appendix I. Mark-Selective Fishery Post-Season Report Templates.

Templates with examples are provided below in Appendix Tables I.1 and I.2.

Appendix Table I.1. Coded-wire-tag sampling methods and processing of tags in all fisheries and escapement locations. This information is required for choice of estimation of impacts on unmarked fish.

B2: Agency		*WDFW*		E2: Year *2011*			
		Chinook Salmon			Coho Salmon		
Region	Sector	CWT Sampling Method	Tag Detection Method	Tags Processed	CWT Sampling Method	Tag Detection Method	Tags Processed
Ocean	Troll	Direct	Electronic	All	Direct	Electronic	All
Strait of Juan De Fuca	Troll	Direct	Electronic	All	Direct	Electronic	All
Strait of Juan De Fuca	Sport	Direct	Electronic	All	Direct	Electronic	All
Puget Sound	Net	Direct	Electronic	All	Direct	Electronic	All
Area 8/8A	Sport	Direct	Electronic	All	Direct	Electronic	All
Freshwater	Sport	None	None	NA	None	None	NA
Freshwater	Net	Direct	Electronic	All	Direct	Electronic	All

Instructions for Table I.1:

Cell	Description
B2	Enter Agency Name
E2	Enter Fishing Year

Sampling information is to be provided in two sections. The sampling programs described in Section 1 are presumed to apply, unless specifically noted in Section 2.

One entry per region and fishery sector as appropriate

Column	Description
Region	Fishery Reporting Region
Sector	Troll, Sport, Net, First Nations, or Personal Use
CWT Sampling Method	Direct, Voluntary, or None
CWT Detection Method	Visual or Electronic
Heads Processed	All, Only Marked Fish, or Other (describe)

Appendix Table I.2. Information on MSFs that have occurred, locations, periods and locations and what sampling and monitoring was conducted to recover CWTs and estimate total encounters and unmarked mortality and compliance in these MSFs. Compliance includes estimation of mark recognition error (marked fish released) and unmarked retention error (unmarked fish retained and landed). This table provides information on actual implementation of MSFs proposed for season.

B2: Agency						F2: Year					I2: Estimate Type															
Fishery Information						MSF Regulations					Sampling program						Estimated Catches and Releases								Release Mortality Rates	
																	Marked Fish				Unmarked Fish					
Contact Information	Fishery Area	Fishery type	Start Date (MM/DD/YY)	End Date (MM/DD/YY)	Target Species for Fishery	MSF Species	Bag limits adult and juvenile by mark status	Lower Size Limit	Upper Size Limit	Other	CWT sampling method	CWT Detection method	Heads Processed	Mark Rate	Method for Catch Estimation	Method for Release Estimation	Retained	Legal Sized Fish Released	Sub-Legal Sized Fish Released	Extra-Legal Sized Fish Released	Retained	Legal Sized Fish Released	Sub-Legal Sized Fish Released	Extra-Legal Sized Fish Released	Legal and Extra-Legal Sized Fish	Sub-Legal Sized Fish

Instructions for Table 1.2

Cell	Description
B2	Enter Agency Name
F2	Enter Fishing Year
I2	Preliminary
	Final

One entry per each MSF regulation (e.g., reduction in retention or gear restrictions)

FISHERY INFORMATION	
Column	**Description**
Contact Information	Name, phone number, email address for additional information
Fishery Area	Area covered by MSF regulation
Sector	Troll
	Sport
	Gillnet
	Seine
	Personal Use
	Other
Start Date (MM/DD/YY)	Starting date for MSF regulation
End Date (MM/DD/YY)	Ending Date for MSF Regulation
Target Species for Fishery	Chinook
	Coho
	Other
MSF REGULATIONS	
Column	**Description**
MSF Species	Chinook
	Coho
	Other
Bag limits adult and juvenile by mark status	Describe retention limits (e.g., marked fish only, marked only adults, 1 marked adult, 2 jacks regardless of mark status)
Minimum Size Limit	Minimum size limit for retention. Specify unit of measurement (inches, centimeters) and type of measurement (e.g., total length, fork length)
Maximum Size Limit	Maximum size limit for retention if applicable). Specify unit of measurement (inches, centimeters) and type of measurement (e.g., total length, fork length)
Other regulations	Enter information on other applicable restrictions (e.g., barbless hooks, live bowes, tangle nets, mesh size)

CWT SAMPLING	
Collection	Description
CWT Sampling Method	Direct
	Voluntary
	None
CWT Detection Method	Visual
	Electronic
Heads Processed	All
	Only Marked Fish
	Other (describe)
Mark Rate	Enter method to estimate mark rate (None, Observer, Angler interviews, Samplers)
Method For Catch Estimation	Enter method to estimate catches (None, Catch Slips/Tickets, Phone survey, Observer, Angler interviews, Creel Census, Catch Record Card, Log Books)
Method For Release Estimation	Enter method to estimate releases (None, Catch Slips/Tickets, Phone survey, Observer, Angler interviews, Creel Census, Catch Record Card, Log Books)

UNMARKED FISH	
Collection	Description
Retained	Number of fish retained (if unavailable, enter NA)
Legal Sized Fish Released	Number of legal-sized fish released (if unavailable, enter NA)
Sub-Legal Sized Fish Released	Number of Sub-Legal Sized fish released (if unavailable, enter NA)
Extra-Legal Sized Fish Released	Number of fish above the maximum size limit released (as applicable, (if unavailable, enter NA)
Extra-Legal Sized Fish Released	Number of fish above the maximum size limit released (as applicable, (if unavailable, enter NA)

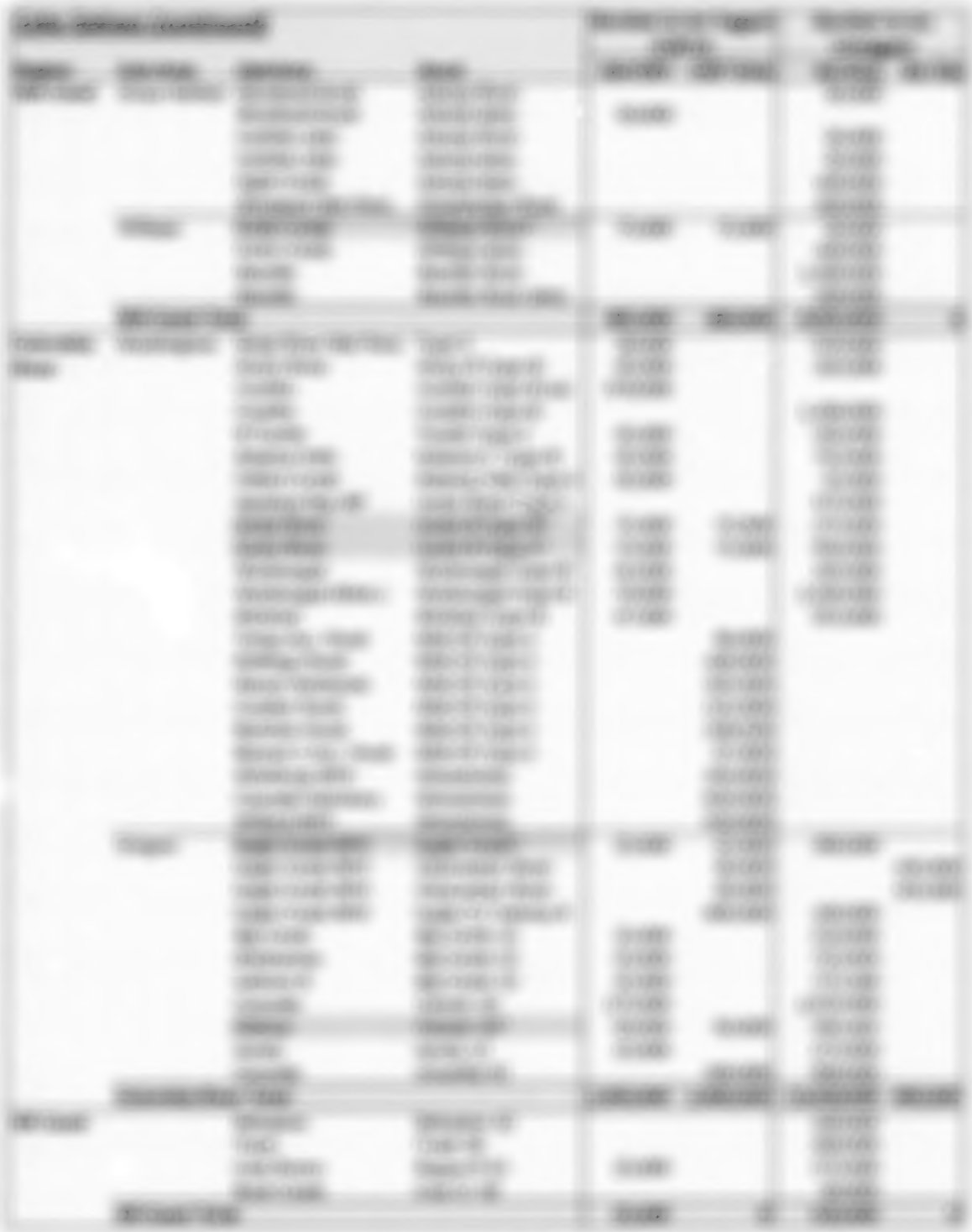
RELEASE MORTALITY RATES	
Collection	Description
Legal and Extra Legal Sized Fish	Assumed total mortality rate for fish larger than the minimum size limit that are released (immediate and delayed)
Sub-Legal	Assumed total mortality rate for fish smaller than the minimum size limit that are released (immediate and delayed)

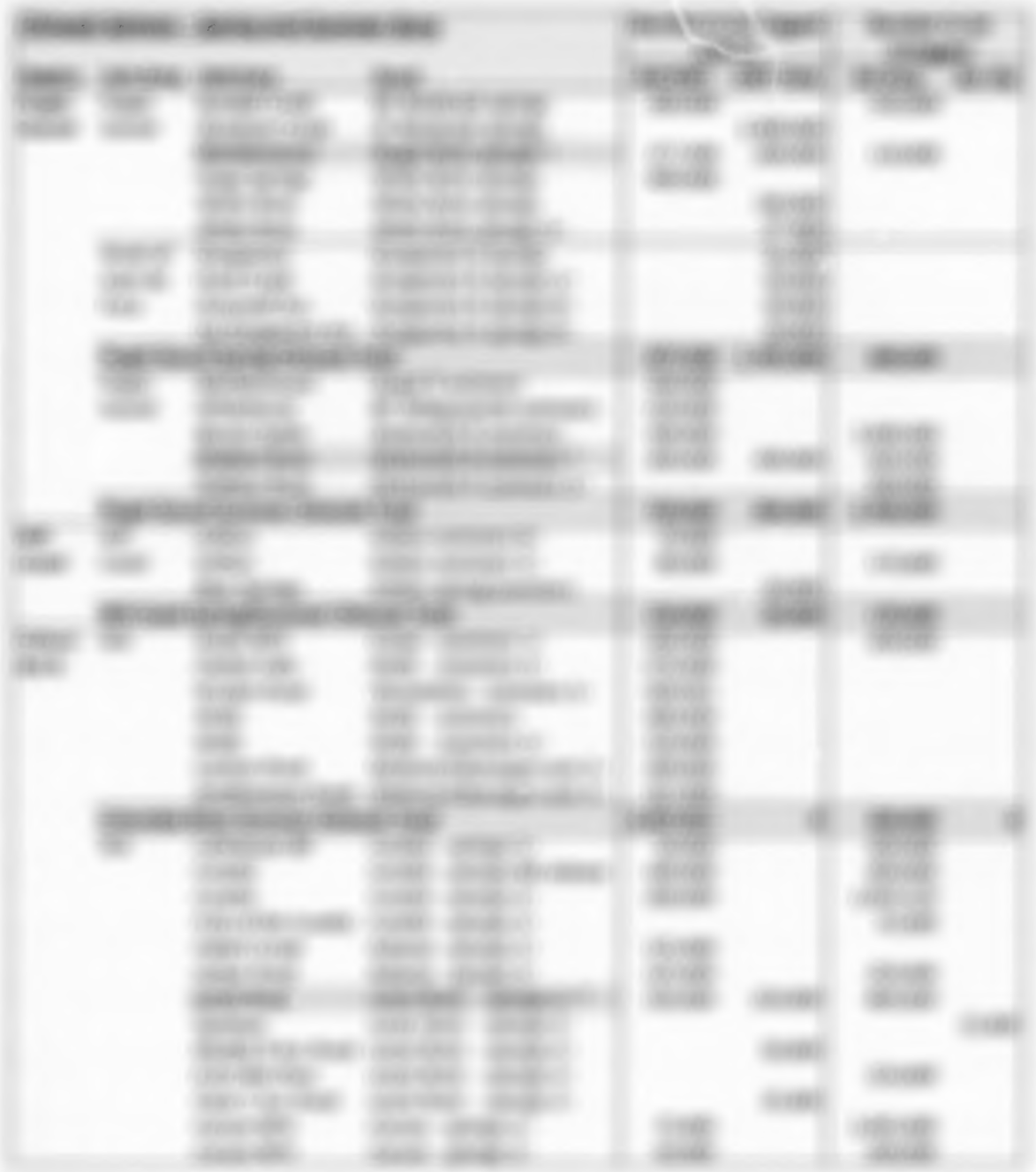
Appendix 1. Mass-marry fish proposed to be released in 2014, by mark and tag status, for Southern B.C., Washington, Columbia River, Snake River, and Oregon Coast.

These summaries include only stocks listed in the mass mark proposals received. Nonfinn, Chinook releases in B.C. are not listed below. Double index tag groups are highlighted green and also denoted by an asterisk.

Coho, continued				Number to be Tagged (CWT's)		Number to be Untagged	
Region	Sub-Area	Hatchery	Stock	Adult CWT	Jack CWT	Ad. Clip	Ad. Fin
Georgia Strait	Lower Fraser	Abbotsford H	Abbotsford H			1,000	
		Chehalis H	Chehalis H			700,000	
		Chilliwack H	Chilliwack H			800,000	
		Clay H	Clay H			1,000	
		Hyak H (1/2 CWT)	Hyak H (1/2 CWT)			1,000	
		Inch H	Inch H*	50,000	50,000	50,000	
		Inch H	Harrison H			100,000	
		Inch H	Inch H			50,000	
		Kendall H	Kendall H			40,000	
		L. Chilliwack	Chilliwack H			20,000	
		Penn Hatchery	Coquitlam H			40,000	
		Skagit (N)	Chilliwack H			20,000	
	Georgia Strait Coast	Capilano H	Capilano H			1,000,000	
		Chippewa H	Chippewa H			1,000,000	
		Keogh H	Keogh H			20,000	
		Mainland Pens/Dock	Mainland H/Inch/H			1,000	
		Mainland H	Mainland H/Inch/H			80,000	
		Tenderfoot H	Chehalis H			80,000	
		Tenderfoot H	Washougal H			80,000	
		Tenderfoot H	Tenderfoot H			100,000	
		Westbridge Tenor	Mainland H/Inch/H			1,000	
		Inch H	Abbotsford H			70,000	
		Inch H	Harrison/Inch H			70,000	
		L. Campbell H	L. Campbell H			20,000	
	Georgia Strait West	Big Qualicum H	Big Qualicum H	50,000		500,000	
		Fanny Bay/QNH	Inch H			10,000	
		Fanny Bay/QNH	Rosewall H			400,000	
		Goldstream H	Goldstream H				100,000
		Jones H/QNH	Jones H/QNH			50,000	
		Nanaimo H	Puntledge H				1,000
		Nanaimo R	Nanaimo R				80,000
		Quinsam H	Quinsam H				80,000
		Quinsam Hatchery	Goldstream H			20,000	
	Johnstone St	F. Hamma/Quadra	Chemainus H			500,000	
		F. Hamma/Quadra	Quadra H			500,000	
		Robertson H	Robertson H*	125,000	62,000	500,000	
		Rosso Canoe H	Robertson H				20,000
	Interior Fraser	Spius (N)	Inglis H	50,000			
		Spius (N)	Salmon Arm/Shuswap				50,000
		Thompson R H	Inch H				50,000
		Spius (N)	Lumberton H	50,000			
	Georgia Strait	Total		900,000	62,000	5,370,000	570,000

[illegible]





Chinook Salmon – Spring and Summer Runs (continued)				Number to be Tagged (CWT's)		Number to be Untagged	
Region	Sub-Area	Hatchery	Stock	Ad+CWT	CWT Only	Ad Only	No clip
Columbia R.	WA	Willard NFH	L White Salmon -spring (>	25,000		212,000	
		L White Salm. NFH	L White Salmon -spring (>	75,000		650,000	
		L White Salm. NFH	White - Wenatchee Spr (>		150,000		
		Klickitat	Klickitat - spring (>	140,000		460,000	
		Tucannon	Tucannon - spring (>		225,000		
		Chiwawa Pond	Chiwawa - spring (>	208,472			
		Leavenworth NFH	Leavenworth - spring (>	200,000		1,000,000	
		Winthrop NFH	Methow - spring (>	633,000			
		Methow	Methow - spring (>		125,000		
		Twisp	Twisp - spring (>		30,000		
	OR	Willamette	So. Santiam /W spring	60,000		64,1,000	
		Willamette	Willamette /J spring	575,000		1,839,000	
		So. Santiam	So. Santiam /W spring	50,000		250,000	
		Eagle Cr	Clackamas /B spring	40,000		176,000	
		Bonneville	Clackamas /B spring	100,000		540,000	
		Marion Pk	Mo. Santiam /J spring	150,000		1,080,000	
		Wilkinson	Wilkinson /J spring	100,000		475,000	
		Warm Springs NFH	Warm spring) - spring (>	770,000			
		Umatilla	Umatilla /E spring	130,000	170,000	580,000	
		Round Butte	Hood River /E spring	80,000		10,000	
		Round Butte	Deschutes /E spring	250,000			
	Columbia River Spring Chinook Total			6,660,472	940,000	12,194,500	15,000
	Snake River	Irrigon	Lockingglass /E	130,000		130,000	
		Lockingglass	Catherine /EE	50,000		67,000	
		Lockingglass	Up Grande Ronde /EE	120,000	120,000		
		Lockingglass	Lostine /EE	130,000		130,000	
		Lockingglass	Imnaha /E	230,000		50,000	
		Dworshak NFH	Dworshak - Spr (>	130,000		510,000	50,000
		Dworshak NFH	Dworshak - Spr (>	120,000		430,000	
	Snake River Spring Chinook Total			930,000	120,000	1,815,000	50,000
OR Coast	North	Cedar Creek	Nestucca /E?	25,000		85,000	
		Trask River	Trask /W	30,000		225,000	
	South	Elk Rivers	Rogue /E-Sp	90,000		1,760,000	
		Rock Creek	Umpqua /E-Sp			240,000	
	OR Coast Spring Chinook Total			145,000	0	2,310,000	0

Chinook Salmon – Fall Run				Number to be Tagged (CWTs)		Number to be Untagged	
Region	Sub-Area	Hatchery	Stock	Ad+CWT	CWT Only	Ad Only	No clip
Puget Sound	Puget Sound	Glenwood Springs	Glenwood Springs falls	100,000		450,000	
		Lummi Sea Ponds	Samish River falls			500,000	
		Whatcom Creek	Samish River Cr falls			500,000	
		Samish	Samish River falls *	700,000	200,000	3,600,000	
		Soos Creek	Big Soos Creek falls *	240,000	200,000	2,800,000	
		Icy Creek	Big Soos Creek falls 1×			300,000	
		Palmer Pnd / Kotta C	Big Soos Creek falls			1,000,000	
		Issaquah	Issaquah Creek falls			2,000,000	
		Minter Creek	Minter Creek falls 0×			1,400,000	
		Rupp Springs	Minter Creek falls 1×	75,000		45,000	
		Gorst Creek	Growers Creek falls			1,580,000	
		Growers Creek	Growers Creek falls *	200,000	200,000	25,000	
		Clarks Creek	Puyallup River falls	180,000		220,000	
		Voights Creek	Voights Creek falls	90,000		1,510,000	
		Garrison Springs	Garrison Springs falls			850,000	
		Clear Creek	Clear Creek falls *	200,000	200,000	3,100,000	
		Kalama Creek	Kalama Creek falls	100,000		500,000	
		Tumwater Falls	Deschutes River falls			3,800,000	
	Hood Canal	George Adams	George Adams falls *	225,000	225,000	3,350,000	
		WEG G	George Adams falls		80,000		
		Hoodsport	Hoodsport falls	200,000		2,600,000	
		Hoodsport	Hoodsport falls 1×			120,000	
	Strait of Juan de Fuca	Morse Creek	Elwha River falls 1×		200,000		
		Elwha	Elwha River falls				2,500,000
		Elwha	Elwha River falls 1×		200,000		
		Hoko Falls	Hoko River falls	200,000		220,000	
	Puget Sound Fall Chinook Total			**1,970,000**	**1,505,000**	**30,470,000**	**2,500,000**
WA Coast		Makah NFH	Sooes River	200,000		2,100,000	
		Educket Creek	Sooes River falls			100,000	
		Salmon River	Quinalt River falls	200,000			
		Quinault River	Quinault River falls *	200,000	200,000		
		Humptulips	Humptulips River falls			500,000	
		Lake Aberdeen	Van Winkle Creek falls			50,000	
		Wishkah (Mayr B)	Wishkah River falls			200,000	
		Bingham Creek	Satsop River falls			200,000	
		Satsop Springs	Satsop River falls			300,000	
		Forks Creek	Willapa River falls *	200,000	200,000	2,800,000	
		Nemah	Nemah River falls			3,000,000	
		Naselle	Naselle River falls	100,000		700,000	
	WA Coast Fall Chinook Total			**900,000**	**400,000**	**9,950,000**	**0**
Colum-bia R.	Washington	Beaver Creek	Elochoman - Wild Falls		190,000		
		Deep R Net Pens	Elochoman - Falls	90,000		910,000	
		Cowlitz	Cowlitz - Falls	1,100,000			
		Cowlitz	Cowlitz - Falls			400,000	
		Cowlitz	Cowlitz - Falls	100,000		1,900,000	
		N Toutle	Toutle - Falls	100,000		1,300,000	
		Kalama Falls	Kalama - Falls	125,000		3,375,000	
		Fallert Creek	Kalama - Falls	125,000		3,375,000	

Chinook Salmon – Fall Run (continued)				Number to be Tagged (CWTs)		Number to be Untagged	
Region	Sub-Area	Hatchery	Stock	Ad+CWT	CWT Only	Ad Only	No clip
Columbia R.	WA	Lewis River	Lewis River - Falls (wild)	100,000			
		Washougal	Washougal - Falls	150,000		2,850,000	
		Spring Creek NFH	Spring Creek - Tule °	405,000	405,000	9,690,000	
		L White Salm NFH	Spring Creek - Tule Falls	200,000		1,500,000	
		L White Salm NFH	L White Salm - URBs °	200,000	200,000	4,100,000	
		L White Salm NFH	L White Salmon - URBs	200,000		1,500,000	
		Klickitat	Klickitat - falls	450,000		3,600,000	
		Hanford Reach	Hanford - Wild	200,000			
		Ringold	URBs	200,000		3,250,000	
		Priest Rapids	Priest Rapids – URBs °	600,000	600,000	5,825,543	
	Oregon	Big Creek	Big Creek Tule 13 °	200,000	200,000	4,750,000	
		Big Creek	Big Creek Tule 13	50,000			
		Bonneville	Spring Cr Tule 60	150,000		4,300,000	
		Bonneville	URB LW Salmon 95	150,000		2,350,000	
		Bonneville	Umatilla 91	240,000	240,000		
	Columbia River Fall Chinook Total			**5,135,000**	**1,835,000**	**54,975,543**	**0**
Snake River		Lyons Ferry	Lyons Ferry - Falls	400,000			
		Lyons Ferry	Lyons Ferry - Falls 1+	225,000	225,000		
		Irrigon (LSRCP)	Snake River (Hells Can)	200,000	0		200,000
		Irrigon (IDFG)	Snake River	228,054	156	651,123	413
		Umatilla	Umatilla 91	300,000	300,000[1]		
	Snake River Fall Chinook Total			**1,353,054**	**525,156**	**651,123**	**200,413**
OR Coast		Trask River	Trask R 34	30,000		108,000	
		Salmon River	Salmon R 36	200,000			
		Cedar Creek	Nestucca 47			100,000	
		Millicoma	Coos River 37	30,000		70,000	
		Noble	Coos River 37	30,000		570,000	
		Morgan	Coos River 37	60,000		1,032,500	
		Rock Creek	Cow Creek 18			225,000	
		Gardiner STEP	Smith R 151			170,000	
		Bandon	Coos River 37			300,000	
		Elk River	Elk River 35	315,000			10,000
		Elk River	Chetco 96	35,000		200,000	
		Indian Creek	Lower Rogue 61			90,000	
		Cole Rivers	Coos River 37	30,000		170,000	
		Cole Rivers	Coquille 44			174,500	
	OR Coast Fall Chinook Total			**730,000**	**0**	**3,210,000**	**10,000**

[1] Agency-only w/rc